

Contents June 1919

Vol. XXIII



No. 6

NEVER, I believe, has there been a greater variety of subjects tending to please every sort of reader from the most enthusiastic bug, through the technical thinker down to the veriest novice.

There are articles on the development of the sea sleds and the hydroaeroplane in the war; secrets are revealed for the first time on the invention and development of the detectors that located the submarines; on the radio compass by which a ship's course is directed by wireless, and on the coastal motor boats devised by the British. Cruising stories and articles dealing

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with purely the sporting side of the game; others on building removable cabins, laying down the lines of new boats, making the anchor hold, the best interior arrangements, ideal auxiliaries, keeping the motor in shape, and a discussion of the Diesel engine.

Finally, for the boat and accessory exporter a comprehensive analytical article has been prepared by our Associate Editor, Harwood Koppel, on the best markets abroad.—Charles F. Chapman, Editor.

MoToR Boating, 119 West 40th Street, N. Y. William Randolph Hearst, President; Joseph A. Moore, Vice-president; Ray Long, Vice-president; Julian M. Gerard, Treasurer; W. G. Langdon, Secretary. Copyright, 1919, by International Magazine Co. Telephone Bryant 6000; Western Office: Hearst Building, Chicago, Ill. Published monthly by International Magazine Co. Trade Mark registered. Single copies, 25 cents; yearly subscription price, \$2.00; foreign postage, \$1.00 additional; Canada, postage 50 cents.



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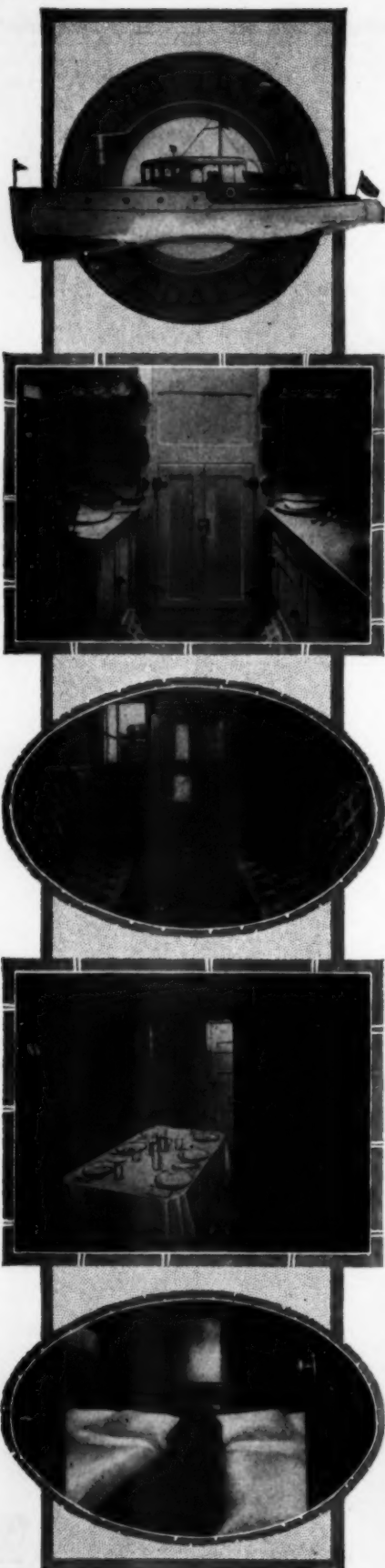
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The Fifty Footer



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**MOTOR
BOATING**



A sea sled with a land airplane on deck. The plane is launched from this position

The Wonderful Development of Sea Sleds

With Slightly Modified Underbodies and Powered with Four High-Speed Marine Motors and Surface Propellers the Boats Designed by Albert Hickman Again Prove the Superiority for Speed and Seaworthiness

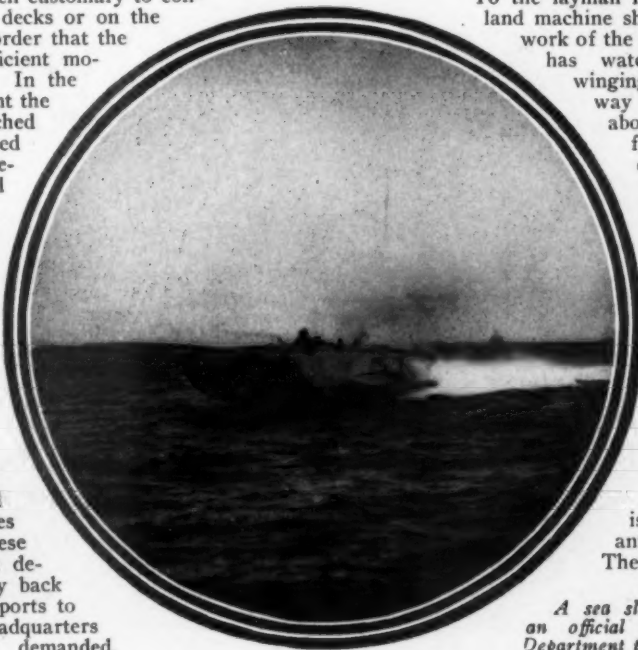
THE Navy Department in tests carried out recently at Hampton Roads, Va., has demonstrated that airplanes can be launched from extremely small craft out at sea, weather permitting, which is vastly important in war time as it obviates the necessity of equipping the large battleships and cruisers with runways for launching the planes and proves the practicability of the land machines for sea service. It has been customary to construct runways along the decks or on the barrels of turret guns in order that the airplanes may attain sufficient momentum to take the air. In the Hampton Roads experiment the airplane was simply attached to a high-powered sea sled with a special releasing device and when the sea sled had attained sufficient speed the airplane was released and from the momentum given it by the speed of the sea sled it took the air without a hitch and without difficulty.

It was valuable also in demonstrating that small scouting craft which could attain sufficient speed could take airplanes off shore with them in times of war and then release the land planes to do scouting and these planes after securing the desired information could fly back to land and make their reports to the naval or army headquarters ashore where this was demanded.

Hydroaeroplanes with their cumbersome and weighty pontoons for starting and landing on the water are no longer necessary for this service. An ordinary airplane was attached to an ordinary sea sled, held down by releasing gear, and the sled driven at such high speed with its own motors that sufficient air speed was attained to enable the machine to be flown directly on being released from the sled.

To the layman it may seem strange that a land machine should want to substitute the work of the seaplane, but to anyone who has watched the hydroaeroplanes winging their discreet and upright way a thousand or two feet above the water, while 2,000 feet higher up the Army machines from Fortress Monroe were doing flipper turns, loops, and tail spins, the reason at once becomes apparent from another angle. The ability of the airplane to execute maneuvers in the air that the hydroaeroplane dare not undertake is of the utmost importance in time of war for this extra mobility is invaluable in fighting.

This is not alone the reason, however, for there is also the critically important feature of light weight. The great majority of the seaplanes so far built have been considerably heavier than land



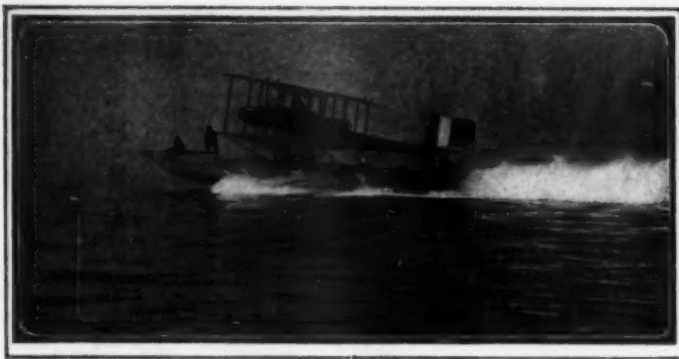
A sea sled on an official Navy Department trial

machines of similar dimensions. Whether they are supported when afloat by pontoons or by a flying boat type of hull, the pontoons or the hull must be made sufficiently strong and heavy to stand the punishment incidental to getting off or landing in rough water, and then the same heavy pontoons or hulls must be carried with the machine into the air where their extra strength and weight are of no value. It is obvious that if the sea-going airplane could get rid of its excess weight of pontoons or hulls while in the air, this load could be replaced by the same weight in men, fuel, bombs or guns and ammunition, and the plane be given a greater radius of action and thus be made a more valuable military unit.

Captain H. C. Mustin, of the Navy, was responsible for the idea of carrying a land airplane to sea on a float driven by independent motors, the motor float being capable of developing such speed with its own engines as to enable the plane to be flown, without a run, on being released.

The Hickman sea sled was selected as the boat suited to the experiment, the main features considered being the sled's great stability at rest, her planing ability, dryness, seaworthiness and automatic stabilizing when at speed, and the fact of being able to apply high powers efficiently by using more than two independent surface propellers.

The design of the boat was a development from the design of Mr. Hickman's 50-foot, four-engine sea sleds. Navy Department officials were taken out from Boston for rough water trials in one of these boats and the 50-foot size was decided upon. The design was modified for this special service by Captain Mustin under the direction of the



Getting underway

boats must have in order to withstand the terrific strain.

The big sleds were built throughout, hulls, engines, and installation by Murray & Tregurtha Company and preliminary trials were carried out at Boston. The boats were then sent to Hampton Roads where the planes were mounted, and while running trials with the planes aboard were credited with speeds in excess of 55 statute m.p.h., what the maximum speeds may have been are known only to the Navy Department.

A question that arises naturally is: What happens if the land plane with wheels and landing gear, wishes to alight on the water? One answer to that is that there are methods by which a land machine can be fitted for alighting on the water, so that she can be pulled aboard the boat again. But generally sea sleds will be used for launching land machines not far from the coast or be carried as a part of the equipment of larger warships for launching the planes

where the larger ships are equipped with landings. It is probable that a plane mounted on a sea sled could cruise at sea on the water and get off under much more severe weather conditions than could an ordinary hydroaeroplane, and it seems within reason to ask just how much this new development may affect the future of the airplane and the sea-plane.



One of the sea sleds returning to her port, after launching her plane. Speeds of 50 miles per hour made possible great things (Above): Four six-cylinder 450 h.p. M & T motors were used as the power plant for the sea sleds

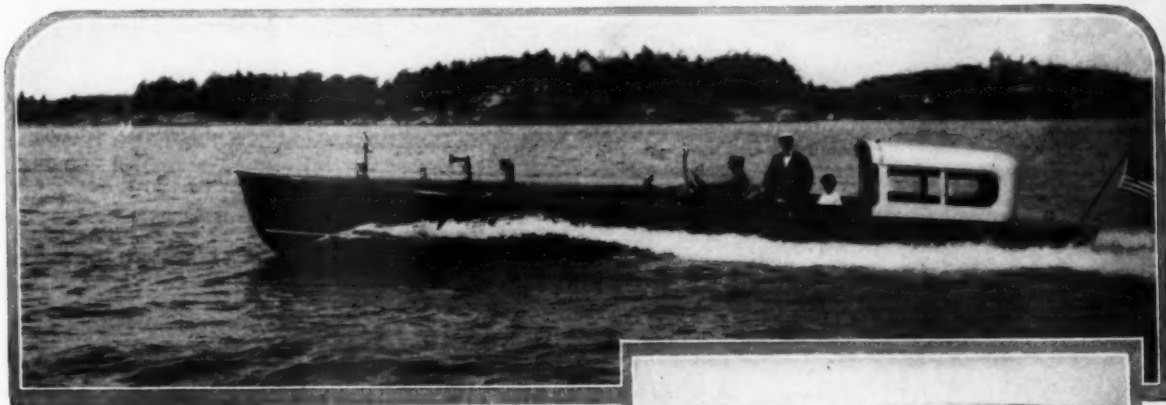
Runabouts For He Who Runs

This Graceful Type of Craft Superior in Beauty to the Limousine or Sedan Motor Car May Still be Built in Time for This Season

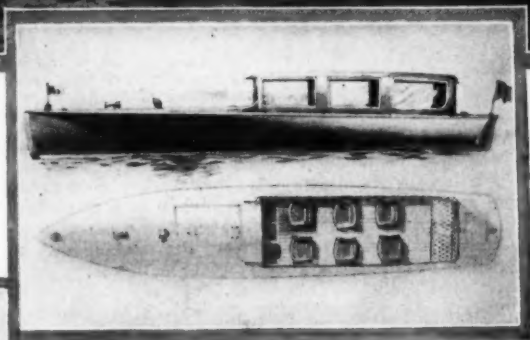
HE who hesitated to order his motor boat for the present season immediately after the armistice was signed was lost in so far as being able to secure a craft in time, of the cruiser type, but if he be quick now there is still hope for him, for he may order and have built a runabout of the design his heart desires and still have her in the water in time to enjoy the sport of motor boating this summer.

No type of motor boat is so well adapted for a number

stands out in a fleet like the best built of the sedan motor cars stand out among a bunch of cars. As the sedan motor car seems to instinctively make one feel that it may be seen any afternoon standing in front of the country club, no matter if at the moment it is wedged in between a bunch of mediocre utility cars and work trucks in some city street, just so does the sight of the limousine or sedan runabout, in the middle of a fleet of home-built cruisers and motor work boats convey the feeling that a little later in the day it



The top of the limousine type does not detract materially from speed when properly designed. This 35-footer with an eight-cylinder Sterling motor has a speed of 31 m.p.h.



This limousine type runabout was developed by the Ditchburn Pleasure Boats, Ltd., of Gravenhurst, Muskoka. This type is 35 feet long with a 7-foot beam, and maintains a speed of 23½ m.p.h., with a four-cylinder, 85 h.p., Sterling engine. The same type with a six- or eight-cylinder motor should approximate 30 miles and over. There is practically full head-room in the cabin and a partition back of the driver's seat



Here is a runabout of the Sedan type built in a 35-foot length for ferry service between a railway station and a waterside summer home. It is a good all-the-year-round boat affording ample protection from all sorts of weather and has certain advantages over the cruiser

of purposes as this graceful craft, affording as it does speedy communication between one's summer home and the railway station, if the home and station are situated on bodies of water; fast service between a larger yacht and the shore, or just for plain purposes of pleasure.

The runabout is quite an exclusive type of boat and

will be found tied up to the dock of the yacht club. It just seems to belong and have its being amid exclusive surroundings.

Nothing is more important for a boat of the runabout type than reliability of operation and in this respect the

(Continued on page 57)

Detectives of the Deep

Developing Detectors to Determine the Detonation of Depth-Charges
Dealing Death and Destruction to Diabolical but Dazed Demoniacs

By Brewster S. Beach



Submarine base at New London, Conn., where the listening devices to detect submarines were developed before the work was coordinated with the Nahant station and removed to the latter place

Photographs by International Film Service

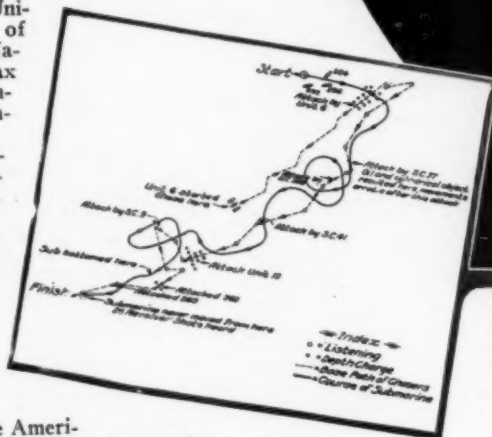
THE principal problem in U-boat strafing during the war was primarily to locate the underseas craft that was to be destroyed. It was easy enough to place a submarine hors du combat when it was visible but to accomplish the same object when the vessel was out of sight and particularly below the surface was a matter that required the gravest planning and the best engineering thought of the Allies.

Therefore, when this country pitched its hat into the ring and pulled off its coat Secretary of the Navy Josephus Daniels summoned to his assistance one of the most eminent groups of scientists that the country could gather. Dr. W. R. Whitney, director of the General Electric Company's research laboratories was selected to head this group, which gathered for purposes of experimentation at Nahant, Mass. Dr. Irving Langmuir was in control on the ground. Others who made up the party included Prof. R. A. Milliken, head of the Department of Physics of the University of Chicago, and chairman of the Physics Committee of the National Research Council, Prof. Max Mason, Dr. W. D. Coolidge and others of the National Research Council.

Professor Milliken originally conducted his experiments at New London, but later the work was co-ordinated at Nahant. Experts were also furnished from the plants of the Submarine Signal Company, the Western Electric Company, and the Victor Talking Machine Company. The laboratories of these concerns were placed at the disposal of the scientists and the whole matter was guarded with the utmost secrecy.

From their work was evolved the American Submarine Detector, a device that made it possible to destroy the U-boats by the score where previously they were

Capt. R. H. Leigh, in charge of the anti-submarine warfare for the American waters



(Left)
One of the most dramatic incidents of the war occurred when the crew of a doomed U-boat committed suicide on the bottom of the ocean while the Listeners on the American chasers plainly heard the shots

destroyed singly. The work of these scientists was so important that the British government sent admiralty officers, the French government naval engineers, and the Italian government its own scientists to view their work. All of this was done unknown to the general public.

The visits of the foreign scientists were also helpful to the Americans, who thus had an opportunity to learn the results of European experimentation on the problem of a submarine detector.

The early devices worked under certain disadvantages. They were first designed to be placed over the side of the surface craft about amidships, but it was discovered that the hum of the motors of the surface vessel would interfere with the successful operation of the device and so another was designed to trail over the stern about 100 feet or so and this made it unnecessary to stop the boat's motors to listen through the device. This led to a third device which protruded through the hull of the listening ship and was a part of the stationary equipment. A similar device was evolved for use on the Allied submarines, and finally, at the request of the British Admiralty, the device was so improved as to be made adaptable for use on airplanes, balloons, and dirigibles.

The principle of the device is based on the sound-wave transmission through water, and depends for its direction-getting qualities on the peculiar and heretofore little understood faculty of the human ear to detect the direction of sound by the shifting of sound from one ear to the other. This was deemed so important that the "listeners" were trained at a special school established at Nahant.

When the device had reached a certain stage of perfection the Navy Department sent it abroad with Capt. R. H. Leigh, of the Bureau of Steam Engineering, to be demonstrated to the British Admiralty. This demonstration was so successful that it was adopted by all of the Allied navies. Others in Captain Leigh's party included: Lieutenant Carter, U.S.N.; Ensign Welch, U.S.N.R.F.; six enlisted men and C. E. Eveleth, C. F. Scott, T. P. Collins, of the General Electric Company, and W. L. Nelson, of the Western Electric Company. They sailed on U.S.S. Delaware, November 22, 1917, and joined the British Grand Fleet at Scapa Flow.

In the first real experiment in this country to test the device three submarine chasers were sent from the base at New London to Nahant and American U-boats were sent from Boston. The submersibles went down one at a time and the chasers equipped with detectors trailed them about on the surface. Other tests followed in which it was demonstrated that the device could differentiate between underseas and surface craft. Here was where the Victor Talking Machine Company was called in, for phonograph records of the various sounds were made and these records were later used in training the listeners. Listening stations were equipped around Boston harbor and at night the Navy attempted to get a submarine into the port, but she was

detected and a full report on her course and activities was flashed to headquarters.

One of the interesting incidents of the tests occurred one day in hazy weather when a chaser equipped with the device was lying near Bartlett Reef with her detector down waiting for the submersible she was to practice with to submerge. Suddenly the listener below decks sang out that he heard a submarine. The bearing of this submarine was west and soon others heard her too. In a moment all was excitement. Guns were made ready for instant action, depth bombs were placed in the best positions and the crews were on the alert.

The sounds continued for almost fifteen minutes, and all of the time the submarine seemed to be approaching unsuspectingly to its almost certain doom. Just as the crews of the chaser and the American U-boat with which it was to practice were ready to go into action the fog lifted for an instant and a submarine of the D type appeared with the American colors hanging from her staff.

With practice trained operators could without trouble detect the difference in sound made by surface and underseas vessels for from fifteen to twenty-five miles, providing there were ideal weather conditions, but even in unfavorable weather the device was effective from 3 to 8 miles.

In fact, the device was so good that within five miles the engine characteristics of different vessels was clearly marked even to the point of identifying by name unseen vessels after they had been observed previously for more than one time. Another, and one of the most important improvements made on the device enabled it to show when a submarine changed from her oil engines to electrical drive, which was necessary every time she submerged. The direction of the sound, too, could usually be computed within a very few degrees of its actual location.

New experimental work was undertaken on the Mohawk River at Schenectady, where the works of the General Electric Company are located, and when the river became frozen the work was continued at Key West.

Both Mr. Eveleth and Mr. Scott joined the combatant Allied forces to supervise the detectors' use under battle conditions, while Captain Leigh was appointed by Admiral Sims

to take charge of anti-submarine warfare, and in this duty spent many nights on British trawlers and subchasers in the Channel.

One of the dramatic incidents of the war in which the detectors played their part occurred when three chasers were out on patrol. One of the ships in the unit heard what sounded like a submarine. In a few minutes all three listeners had picked him up and the bearing of his course was being plotted. The middle chaser, the flagship, was getting readings showing that the submersible was in a direct line astern and coming toward her.

The sound was very loud, as though the underwater

(Continued on page ..)



Listeners required special training and so a school for that purpose was established at Nahant, Mass. A trained listener could detect the difference between a surface craft and a submarine and the difference between a U-boat on the surface and submerged

Page 32

It Was a Dinghy, Not a Dinky Cruise

Who Was Captain, Who Was Crew, Really No One Ever Knew
For Everyone Works on a Cruise, All Are Happy There Are No Blues

By Charles R. Drake

IF you are a lover of nature and enjoy roughing it in the open, you will appreciate the amount of fun we have on our yearly cruises in a 12-foot sailing dinghy. We have at present twenty-two of these little racing boats in the Genesee Dinghy Club, situated at the mouth of the Genesee River, Charlotte Harbor, Rochester, N. Y. This boat is 12 feet over all, has 4 feet, 6 inches minimum beam and 18-inch depth amidship, carrying 96 square feet of canvas. The decks are of mahogany with stem, keel, ribs, and transom of oak and planked with white cedar. The Genesee dinghy is designed and built by E. W. Delano who, although he is



Just one lazy day after another with nothing to do until tomorrow but sail and motor, cruise, and be contented

We sailed along for about two hours, enjoying the offshore breeze, and when it died out almost completely we were forced to fasten on the little outboard motors (which we always carry on a cruise) and go chugging along under power, each boat with a motor taking a boat in tow.

After about an hour of this my bunkmate, showing signs of a regular cruise appetite, decided it was time to eat again, so he proceeded to get a meal of soup, coffee, crackers, and rolls. This, no doubt, seems a big undertaking in a 12-foot boat, but

is in reality very simple. With the aid of two condensed alcohol stoves set in two water pails you would be surprised to see how quickly soup can be made and coffee boiled. The pails hold the heat in and guard against any chance of a fire on board should the stove tip over

(Continued on page 88)



Boats were beached for the night and crews enjoyed the slumber that the pleasurable exertion of the day's cruising made dreamless

seventy-six years old, never misses a chance to go cruising with his boys, as he calls us. Two men can sleep in a boat. For protection against the elements we have a boat-tent stretched across the boom and fastened under the rail.

On the morning of August 2, at 7 a. m., eight hale and hearty good sailors hoisted canvas to the breeze for an eight-day cruise down the lake, and throwing our business cares and worries to the four winds, settled down for the first leg of the trip with a good breakfast under our belts.



When the wind died down the outboard motors were impressed into service to tow the powerless sailing craft



First call for dinner. One always has an appetite on a cruise

Fruitful Foreign Fields

Export Possibilities Analyzed Especially for the Builders of Boats and the Manufacturers of Motors and Accessories

By Harwood Koppel

THERE is one vital factor that will play its part in the export situation for years to come, or at least until conditions are more settled throughout Europe that seems to have been generally overlooked. A factor, that like the ill wind that blows some good to someone means perhaps dire catastrophe for America's competitors for the export trade, or perhaps it is just a threat, but nevertheless its shadow extends like a pestilence over most of Europe, the shadow of Bolshevism.

At the moment it is having its effect on Germany and when the Germans are again in a position to trade without restriction with the countries of the world it will still have its effect on the land of the Hun. For with Bolshevism rampant or even with the threat of it in the air, big manufacturers lose their incentive. That is a point that cannot be stressed too strongly. True, it is a situation that does not apply particularly to the export field of motor boat builders and engine manufacturers or accessory makers but applies to trade in general, but what applies to the whole field applies in a proportionate part to specialized lines.

If the proprietor of a German yacht building yard or the shareholders of a German industrial enterprise building motors and parts feel that today or tomorrow, or the day after that their workmen may step in and take from them in an hour what it has taken them years, or perhaps generations to build up, they will lose their incentive to go forth and fight—yes that is the word—fight for trade—as

has been their wont in the days of yore. Why should they plan and scheme for trade domination in the line of engines or motor boats and lose sleep only to have someone whom they secretly despise step in and reap the reward?

South and Central America and the West Indies undoubtedly offer the best field today for the American ex-



In far off Zanzibar, with its medieval stockaded forts and its antique brass cannon, modern motor boats chug pleasantly around its harbor to greet incoming liners and for use on the rivers which stretch into the hinterland

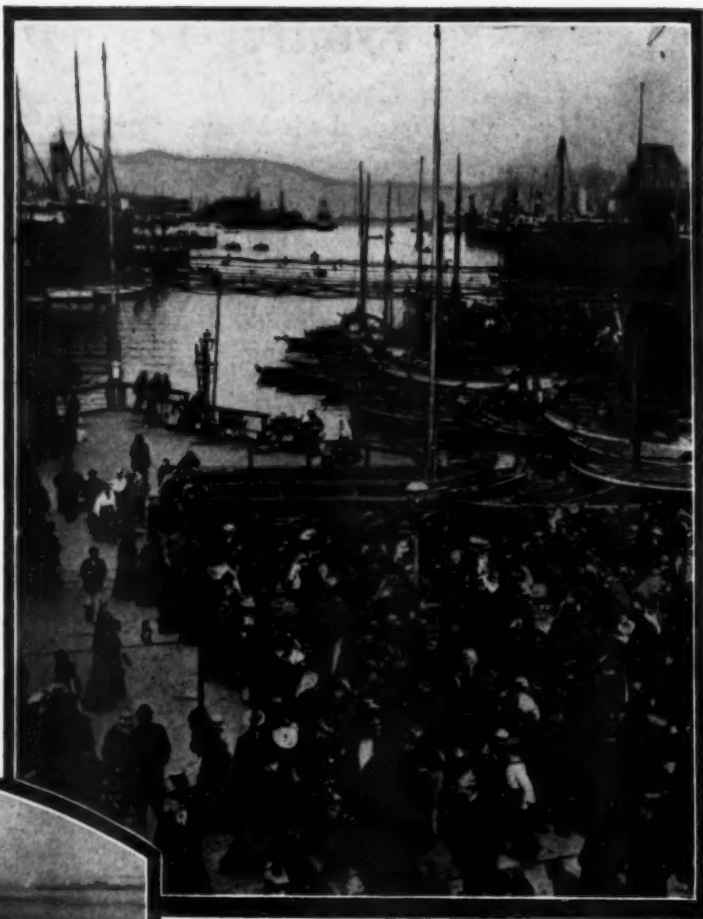
(Left) The waterfront of Callao, Peru, presents an animated scene with craft standing in and out at all hours. Many of these are motor boats which have demonstrated their value to the progressive Peruvians



porter, no matter what his line may be. Over Europe the pall of the smoke of battle still hangs and the countries of that continent must endeavor to rehabilitate themselves by discouraging as much as possible the importation of manufactured products from the United States and other countries. In Great Britain, or to be more exact in England, Scotland, Ireland and Wales such plants as could be, were turned into munitions works but these have already either been reconverted to their peacetime pursuits or are being rapidly so converted. Competition there will undoubtedly be strong. It must be borne in mind that few works which were engaged in the building of marine motors or fittings of any description were changed. All of these products which could be made were turned out as rapidly as possible and there were extensive additions to existing plants and new ones were constructed.

American boat and motor builders who desire to secure their share of the lucrative foreign trade which is fairly beckoning to them must realize that the land of John Bull is hereafter to be their strongest competitor, whether it be in Central Europe, the Balkans, Asia, Africa or in the Americas. John Bull's own land is almost a barren field for exporters of marine goods. France being in such proximity to England will naturally be prone to turn to that country for many things and the British will probably be able to undersell Americans particularly in the lines in which the British are strong competitors. Northern Europe and Spain may be better, but it must be borne in mind that the Scandinavian countries are also great boat and marine builders. Spain is not a large purchaser of boats and motors and in Italy the feeling over Fiume would undoubtedly affect trade relations. The Balkans have not recovered from the effects of the war and both Asia and Africa are limited buyers. Central and South America being closer are the logical markets for our marine export sales and should be dominated by us.

The countries to the south of us are not primarily manufacturing nations and they hold no records for marine construction of any sort. Yet, there are some, like Brazil, where there are thousands upon thousands of miles of inland waterways. And others with coast lines, including Brazil, Argentina and Chile, which seem almost without end. What a



The great harbor at Bergen, Norway, is almost choked with many craft, including hordes of motor boats of every imaginable description

(Left) It's a far cry from Norway to Brazil, but the motor boat is just as popular in the South as it is in the North. The harbor of Bahia, a city of 300,000, shows a full fleet of various sized motor boats riding quietly at anchor



Photos by Underwood & Underwood

wonderful field here, then, for the use of motor boats. What magnificent possibilities for live American marine builders to corner this market. But there are certain conditions precedent to foreign trade which must be looked squarely in the face.

The lack of coal in Latin America prevents the manufacture of many articles for which the countries are otherwise suited. True, some coal is mined, but it is infinitesimal, and of an inferior grade. At the present prices which shipping demands coal is too expensive to be used in those countries for purposes other than those of prime necessity, such as for bunkering return steamers, operations of railroads, operations of street railways, lighting and waterworks facilities and the most profitable industries, chief among which is, of course, mining.

With the sale by the Shipping Board of scores of the

merchant craft built during the war and the acquisition of these vessels by private owners transportation facilities will naturally follow the lines of least resistance. If, then, the volume of business offered for carriage to South and Central America is sufficient, sailings will be frequent from all of the principal American ports. For years New York and New Orleans have had several ships a day leaving for various of the nations of Latin America or the islands of the West Indies and these established lines have already announced additions to their fleets and are making arrangements to take care of increased tonnage by extensive improvements to their port facilities both in the United States and in Latin America. The transport of motor boats and engines and their parts will therefore offer no difficulty, and it only remains for other essentials to be understood and mastered.

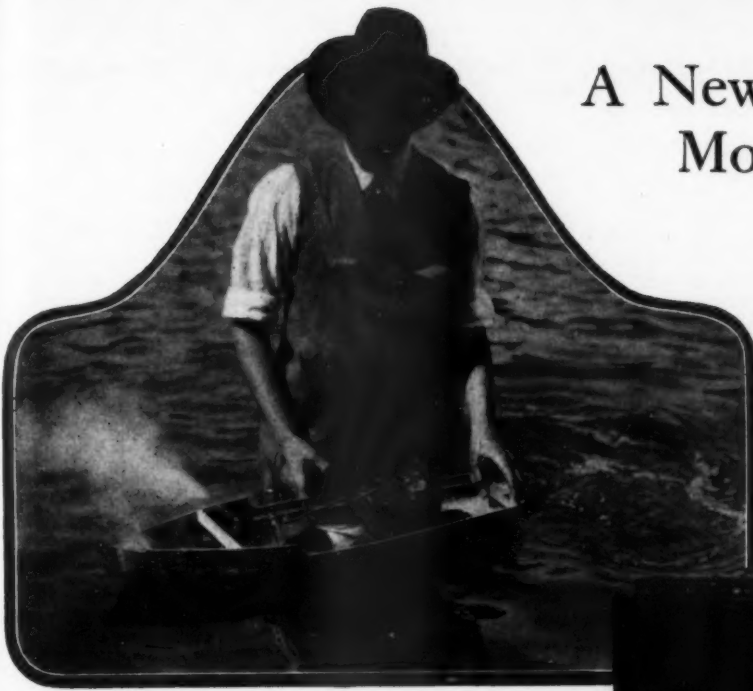
There may be a stimulus to the marine industry in the Latin American countries due to the effect of the war. When these countries found themselves more or less shut off from the rest of the world and bridged only by infrequent steamers their channels of thought were naturally directed toward the idea of building and manufacturing for themselves those things which they could not procure abroad. Some new manufacturing enterprises were established while other products were refined, but steel, which enters so largely in the construction of marine

(Continued on page 86)

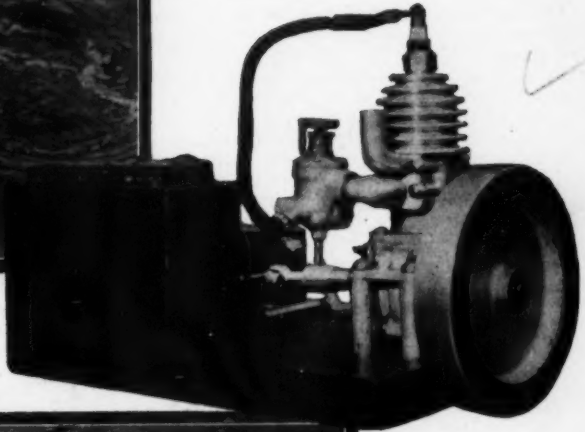
A New Sport—Model Motor Boating

Miniature Boats Powered with Tiny Steam and Gasoline Plants Which It Is Claimed Develop Speeds Up to Forty M. P. H.

By Raymond Francis Yates



Ready to start in a race. Competition among model boats is becoming as keen as Gold Cup events



A miniature gasoline engine for a model boat as complete in every detail as a regular motor

A model steamer getting under way without human guidance. Plans are being made for an international contest



MODEL motor boating is receiving much attention in America at the present time, and it will not be long before it is as popular in this country as it is in England. The closing of the war has greatly accentuated interest here, and during the coming summer months a great many new boats will make their appearance on the park lakes throughout the country. The sport has received great impetus here during the last year through the efforts of several enthusiastic followers who have constructed some notable boats. Plans and arrangements are already under way for a delegation to go to England next summer in order that America may at last have a chance to possess the world's record which is now held by our English cousins. Mr. Westmoreland's boat *Evil Spirit* at present holds the English record, having been credited officially with a speed of 26.7 m.p.h. This does not mean that boats have never attained a greater speed than this, but that this craft is the only one that reached such a speed when officially timed under specified rules and conditions.

The fastest boat which has been produced up to this time in America is known as *Elmara II*. Although never timed officially, this boat is credited with a speed of 36.41 m.p.h., running on a circular course. In fact, the writer has seen this boat traveling at a speed which was greatly in excess of the above mentioned figure. When at top speed it would seem that there was nothing but the propeller in the water. This boat is owned by J. Fawcett Rapp, of New York City, and it is Mr. Rapp's intention to race this boat in competition with English craft next summer. *Elmara* performed last summer on the model boat lake in Central Park. Its power plant is of the full flash type and the engine, which

is a twin-cylinder single-acting one, is a radical departure in design. *Elmara's* successful performances have been made possible by the efficient little engine which she carries. This engine turns the propeller over at 4,000 r.p.m., and when in operation makes a noise similar to an airplane motor.

Many of the trial trips of *Elmara* were made on a circular course, the boat being attached to a 50-foot cord the opposite end of which was fixed to a pole. The boat is so erratic in its course that it was practically impossible to run it free. Running the boat free ended disastrously in several cases, and it was decided that the wisest plan was that of permitting it to run around a pole. A circular course was used with a circumference of approximately 300 feet. This greatly facilitated calculations in timing.

Percival Marshall, editor of the *Model Engineer and Electrician*, of London, has shown a keen interest in the development of model power boating in America, and informs the writer that English enthusiasts are anticipating keen competition from our American boats. In a recent letter to the writer Mr. Marshall states:

"No model boats are being built over here at the present time, but the prospect of competition will give new incentive to the sport after the war, and I have no doubt that English enthusiasts will put up a good fight for the record.

"I should be much interested to have any news of American model speed-boat developments which you may be good enough to send me, and I shall be happy to reciprocate in due course."

Mr. Marshall went on to say:

"If *Elmara* makes good she will have no more apprecia-

tive admirers that the English model speed-boat record holders."

Defending English record holders, Mr. Marshall continued:

"I do not think that model speed-boat builders on this side will be inclined to agree with your statement that the speed-boat record has been transferred from England to America, in view of the fact that Elmara results are unofficial."

In taking this stand Mr. Marshall is perfectly justified, and owing to the fact that records established in England have been made under exacting conditions, according to rules set forth by the *Model Engineer*, it is only fair that aspirants for records over here should race their boats under similar conditions before we can lay a justifiable claim to the world's record.

English power-boat rules follow:

"All boats to be propelled by steam, electric or internal combustion motors, and all power to be generated on the boats themselves except in the case of electricity, where accumulators may be carried on the boat. The entries will be divided into four classes. Class A will include all boats having a displacement of more than 30 pounds and not more than 40 pounds. Class B will include all boats having a displacement of more than 20 pounds but not more than 30 pounds; Class C will include all boats having a displacement of more than 10 pounds but not more than 20 pounds; while Class D will include all boats having a displacement of 10 pounds or under. The displacement is to be taken as the total weight of boat, machinery, and fuel in complete running order. Each boat must be timed over a total distance of not less than 300 yards, which may be divided into separate trips of not less than 100 yards each, or the boat may be tethered by a light line to a fixed post and run on a circular course. The height of the fixed post shall not exceed one-tenth of the radius of the course. At starting each trip power must be turned on, and the engines started and kept running for at least fifteen seconds before the boat is released. The interval between each of the successive trips must be as short as possible, and must be stated in the particulars given. The exact length of the course must be measured, and the exact time, to a second, recorded for each trip. These particulars must be written down and certified by the signature of two members of the executive of either any recognized Society of Model Engineers or Model Yacht Club, who must have been present at the trials. In addition to the foregoing particulars, the prize winners must furnish photographs and descriptions of their boats for publication in the *Model Engineer*. The awarding of the prizes may be summarized as follows:

"Silver Medals to the fastest boats in Classes A, B, C, and D.

"Bronze Medals to the second fastest boats in Classes A, B, C, and D.

"The number of competitors interested in any one boat, either as designers, or builders, will be limited to two. A signed declaration is required, giving particulars as to building of the model, in addition to the usual certificate of performance. Certificates will be given all Class A boats which have an average speed record of not less than 9 m.p.h.; to Class B boats with an average speed of not less than 7 m.p.h.; to Class C boats with an average speed of not less than 5 m.p.h.; and to Class D boats with an average speed of not less than 3 m.p.h."

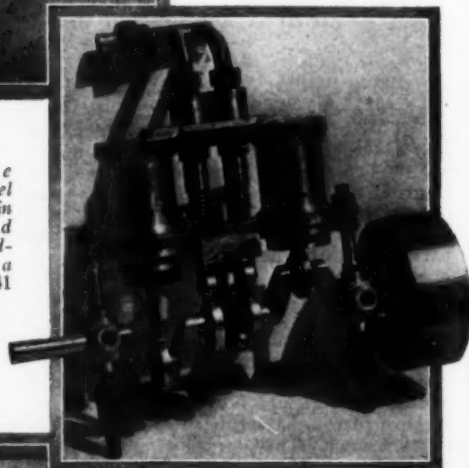
Those who have carefully watched the development and progress of model power boating in this country are unanimous in their belief that the bringing of the world's record to America will be only a matter of time. However, we must not underestimate the ability of our English opponents, who are masters in the art of model power-boat engineering, and who are unquestionably responsible for the origination of the sport.

Adherents to gasoline engine propulsion will be surprised, if not shocked, to learn that flash steam plants are able to drive model power boats much faster than internal combustion motors. Sixteen m.p.h. has been the greatest speed ever attained by a model power boat driven with a gasoline engine. This is probably due to the fact that the model gasoline motor is a very uncertain and balky mechanism. A flash plant system, although by no means easier to handle or certain in its operation, can be truthfully said to be more reliable as a whole, and able to attain a far greater speed than a

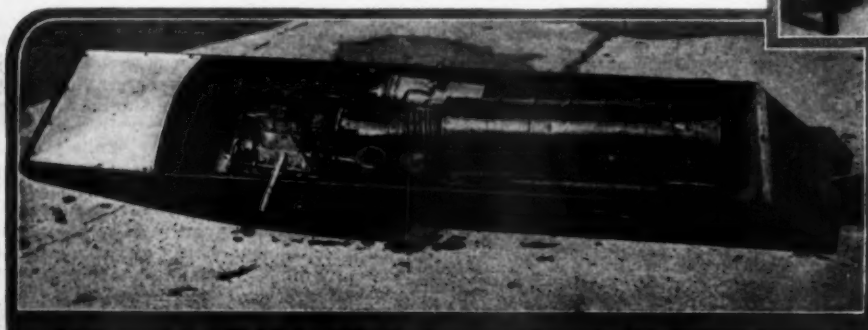
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Elmara, the fastest model motor boat in the United States credited with a speed of 36.41 m.p.h.



Flash steam engine used in Elmara



A view of Elmara II, showing flash boiler and steam engine

No More Marine Disasters

The Invention of the Radio Compass Whereby the Position of a Ship Can Be Readily Located — A Great Protection of Life at Sea

By Jerome Lockenbruck

NCESSITY and invention have strangely linked war and peace in the service of humanity. In nearly every field of industrial and commercial activity, the peculiar needs of war are being transformed to the usages of peace. This is especially true of the many wireless inventions developed by the Navy Department during the war. One of the most important of these is the radio compass, or direction finder, by means of which the location and course of any vessel at sea can be accurately ascertained by a shore station.

As a military measure, all information regarding this wireless invention has heretofore been withheld from publication. But now that passengers on coast and trans-oceanic vessels have the opportunity of observing the operation of the radio compass, a general knowledge of its salient features and its method of operating is a matter of general interest.

With the installation of the radio compass on all ships that carry a general radio equipment, pilots and captains can now prove the accuracy of their polaris and sextant readings; and need never fear losing their course in foggy weather or on starless nights.

At present the use of the radio compass has been limited to communication between shore stations and ships from 25 to 1,500 miles at sea; but experiments have been conducted by ships at sea in an endeavor to perfect the instrument for use under all conditions.

The method of determining the direction of a ship from a shore station involves a simple and speedy operation. Several radio compass stations have been established along the coast in the vicinity of every large port and are daily reporting the bearings of ships heading for port. These stations are located at such distances from each other that imaginary lines drawn from the different stations in the direction of the ship will intersect at a point which is the ship's exact position.

Each radio compass station is connected with a central control station by a land line telegraph or 'phone. Besides this, the equipment of the radio compass stations con-

sists of a radio receiving outfit, and the radio compass itself.

The principle on which the compass works is based on the theory that a rotating aerial can be made to show the direction from which wireless waves come. Consequently, long stretches of wire have been abandoned, and in their place small frames have been erected on rotating shafts, and the aerial wound about the frame. In this way, the aerial can be turned in any direction by the operator. The loudness of the signals determines the direction from which they come. A dial registering 360 degrees, fastened to the shaft, indicates the specific direction.

In actual operation, when a ship is approaching port, she sends the general port call and asks for her bearing. The radio control station at the port immediately notifies the various compass stations by telegraph to obtain a bearing on the ship; and at the same time tells the ship, by radio, to send her call letters for thirty seconds. When all the radio compass stations have obtained the direction asked for and transmitted it to the central control station, the latter flashes, by radio, the directions obtained by the different shore stations. As the locations of the radio compass stations are known to the captain of the vessel asking for his bearing, he can tell, by referring to his charts, just where the lines of direction from the various compass stations to his ship will intersect.

Every ship that enters the port of New York is now being guided to the Ambrose Channel by means of the radio compass; and the results are marvelously accurate.

When the compass is used by a ship in mid-ocean, the possibility of error increases. For, under the circumstances, connection must be established with two or more moving vessels as bases on which to obtain bearings. By means of radio, the ship desiring to know her exact position ascertains the latitude and longitude of two or more vessels with which she is in communication. Then, by using the compass, she endeavors to discover the bearing of each of the other ships on herself.

The operation is the same as when shore stations are used

(Continued on page 57)

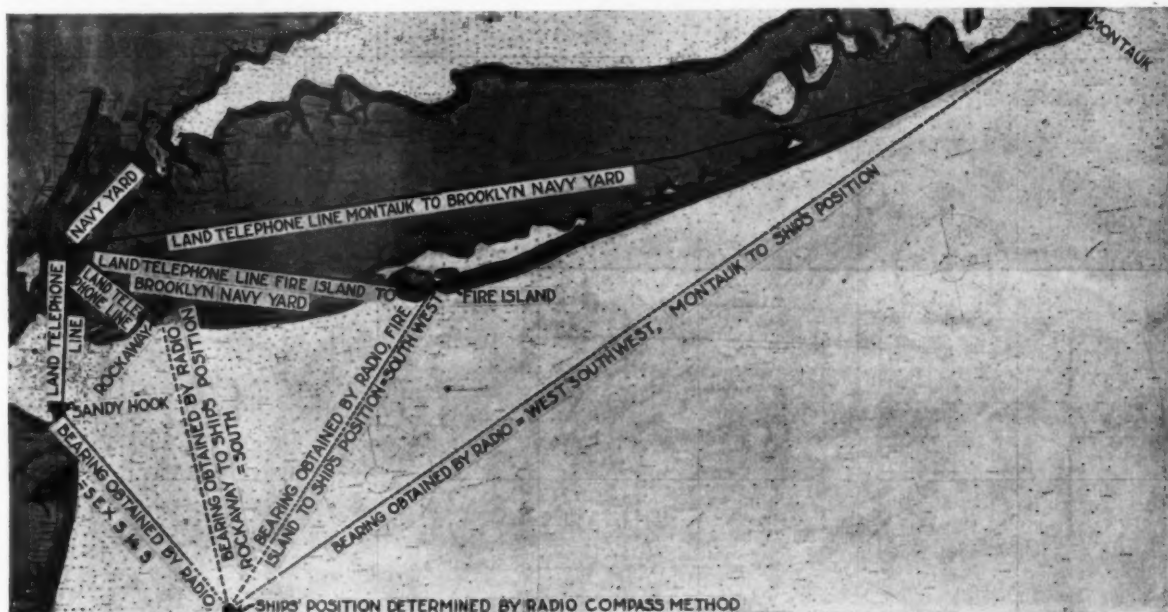


Chart of the South Shore of Long Island and adjacent waters, showing location of radio compass stations, and the method of determining the position of a ship off the coast

The Hydroplane in War

A Heretofore Unpublished Account of a New Type of Motor Boat Which Made Its Appearance During the War and Did Much to Drive the U-Boats from the Seas

WE have all heard of the British M.L.'s and their marvelous performance during the war, but there is a small, and to some, more interesting, arm of the British Navy, a brief description of which follows:

The C.M.B.—the official appellation being Coastal Motor Boat—is merely a hydroplane specially constructed to carry and discharge an 18-inch torpedo. The early type was a 40-foot, single-step craft powered with a 250 h.p. V-12 engine, and in good trim could manage about 45 to 47 m.p.h. This, of course, is not a phenomenal speed, but considering that they carried a torpedo weighing nearly a ton, a crew of three, and gas and oil to last seven hours at full speed, it will be admitted that their performance was not so bad.

Especially so in view of the fact that they had to be as reliable as the modern express cruiser, for they had to go out every night that they could stick it and that they could withstand the terrific battering they often got in choppy seas on innumerable occasions speaks well for the builders.

The C.M.B. first won fame in the early spring of 1917 when four of these little hornets one night stole up the Belgian coast to Zeebrugge, where they encountered four German destroyers. The fight was short and sharp; it was a new method to Fritz and he fared badly. Three tin fish found their marks and at least one enemy destroyer found rest and quietness on the ocean bed. The Admiralty were quick to realize the value of these hydroplanes and thenceforth the Belgian coast was the allotted hunting ground of the C.M.B. and orders were quickly placed for more scooters as they were often called.

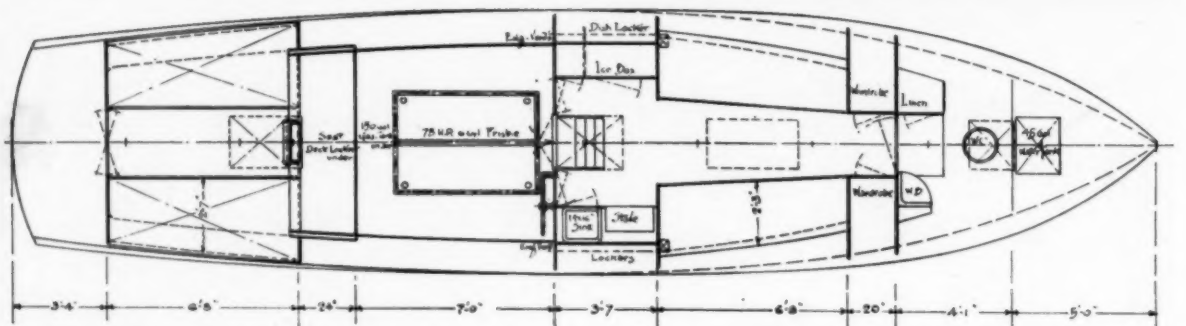
In due course a new type made its appearance, a 55-foot craft, of similar design to the original 40, but powered with two 300 h.p. engines. They were of about the same speed

as the early type but could carry two torpedoes, or one torpedo and four depth charges, in addition to wireless and considerable other necessary war equipment. Added to the double reliability of two engines over one, they were a much better and more comfortable sea boat.

Time went on and Fritz was constantly harried by these sea wasps and many a time he was stung. He even tried to copy them but apparently with dismal results. Many an encounter between destroyers and C.M.B.'s took place. The little egg shells didn't always come off best but they usually did. Fritz was not asleep, however, as his pyrotechnic displays up the coast every night indicated, and his destroyers were constantly on the alert for the water skimmers, as he called them, and he lost no opportunity of giving vent to his wrath as the battle scars on some of the scooters plainly told. But after all, his loss of three of four submarines and double that number of destroyers heavily outbalanced the two or three C.M.B.'s which failed to report back.

But when the time drew near for the famous blocking raid on Ostend-Zeebrugge, every available C.M.B. was pressed into service and the crews worked in feverish excitement for weeks getting everything on top line. At last the big night arrived, and darkness found a strange looking fleet heading slowly for the Belgian coast. There was the now-famous Vindictive towing her two excursion-steamer consorts laden with storming parties, closely followed by the block ships, and on either side, a long line of silent, gray destroyers, and the whole scene dotted with M.L.'s rearing and plunging in the heavy chop. And last, but not least, were some two dozen frail looking shells being towed by destroyers, etc. They looked not unlike great wallowing

(Continued on page 100)



A new sea wolf now building for LeRoy Moody, of New York City. She is a 40-footer designed by Kromholz. The power will be a 75 h.p. six-cylinder Frisbie Motor

A Bit O' Diversion Now and Then Is Relished by Our Fighting Men

Photo by
Keystone
View Co.



Photo by
International
Film Service

*Even the Chasers have
their fitting out period in
the Spring*

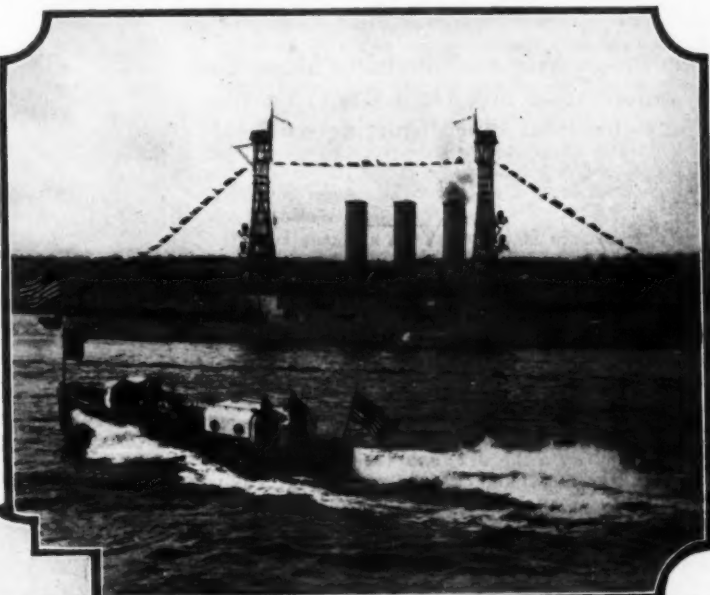


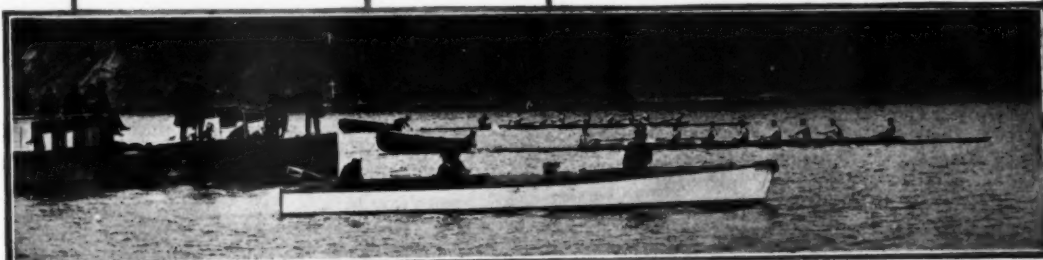
Photo by
Kadel &
Herbert

*Mighty America's Armada dropped anchor in
the Hudson while Gob and Goldstriper swarmed
ashore to enjoy the fleshpots of the Merrymaking
Metropolis of Manhattan. But the motor boat
is now an essential even to the battleship*

Photo by
International
Film Service



*A motor boat which is used by the American
couriers who carry important messages from
Paris to Havre*



The Navy is so accustomed to whipping everything in sight after its experience in the war that it just can't help walloping its rivals in sports. Hence the Eight of the University of Pennsylvania went down in defeat before the Varsity Middies. Motor boats have now entirely replaced steam launches for coaching

Starting Correctly to Build

I—THE LAYING DOWN OF LINES

The Proper Way to Proceed to Make Use of Information and Data Given on the Plans of a Boat When Starting to Build

By William Atkin

This article is the first of a series by Mr. Atkin which will take up the complete building of a boat step by step in the proper order which the construction work should be done. By following the articles in this series any amateur will be able to build his own boat.—Editor.



It is always a good plan to first make a working model of the boat from the plans and table of offsets. Any imperfections will be at once seen.

REMEMBER a time, it seems long, long ago, when the technique of boat design was a perfect mystery to me. I looked upon the drawings that portrayed the model of a boat by straight and curved lines; was greatly puzzled, and wished to know the full meaning of them all, and their relations to one another. The wish grew into a will to know and, as we all know, wherever there is a will to knowledge, knowledge opens its great book and the willing one learns the secrets of many things.

This is what I learned of the lines, and of the models of boats, and of ships, and of one way to, what is called, "lay down" on a convenient floor at full size the lines of a boat.

Practically all boats, large and small, ancient and modern, are built, and have been built for many, many years to a preconceived model or plan.

The wooden model is the older method of predetermining the form of a new vessel. As models of the hull are not generally made nowadays, I shall describe them but briefly as small scale wooden blocks, cut to represent one-half (from the centerline of the hull out) of the proposed boat's form. Usually this model is cut from a built-up block, the layers extending fore and aft, and parallel to the load waterline as shown in the drawing. Figure 1.

It is evident that the joinings between the layers will portray, if viewed from the bottom, the true curve of each waterline. If a model is made to the scale of one-inch to the foot, and the layers are each one-inch thick, their joinings will represent waterlines spaced at a distance of one foot. Station lines are drawn on the model and squared around it so by careful measurements with calipers and rule that the boat may be laid down full size from the model.

The newer and better way of modeling a boat is to draw it on paper, of course to scale, by flat drawings which show to the practised eye, the true contour of the hull as it will appear when completed.

This is accomplished by drawing three views of the hull: in profile; in plan; and in section. Figure II shows these three views in a single drawing, and in very simple form, using a minimum of lines for the sake of clearness.

The naval architect solves all the problems of stability, of buoyancy, of trim and of 101 other items of vital concern to the boat as it will be when completed. Along with correct drawings he supplies

all the necessary dimensions for building the craft.

Those dimensions which have to do with the shape of the hull, and from which the molds, the stem and the stern are made are included in the drawing of the lines, and in a supplementary sheet labeled, Table of Offsets, Figure III. A peculiarity of the dimensions here given is that rather than writing, as example the longer, 1 feet 7 $\frac{5}{8}$ inches, 1-7-5 is written, which is simpler and means the same, namely: 1 = 1 foot; 7 = 7 inches; 5 = $\frac{5}{8}$ inches.

Given the lines then and all the necessary dimensions for laying down proceed.

First a smooth floor is necessary, and for a little boat it should be a foot or so longer than the boat to be laid down; of course also sufficiently wide. I have found that it pays well to lay red or gray building paper over the floor to draw upon. This should be tacked down.

Begin by snapping a straight line at the lower edge of the paper, 2 inches or so from the edge. The process of snapping a line consists of stretching a well-chalked line close to the floor between two nails, drawing up its center several inches from the floor, then releasing it. As it snaps back it deposits its coating of chalk upon the floor, and in a true line. This must later be penciled in for permanency.

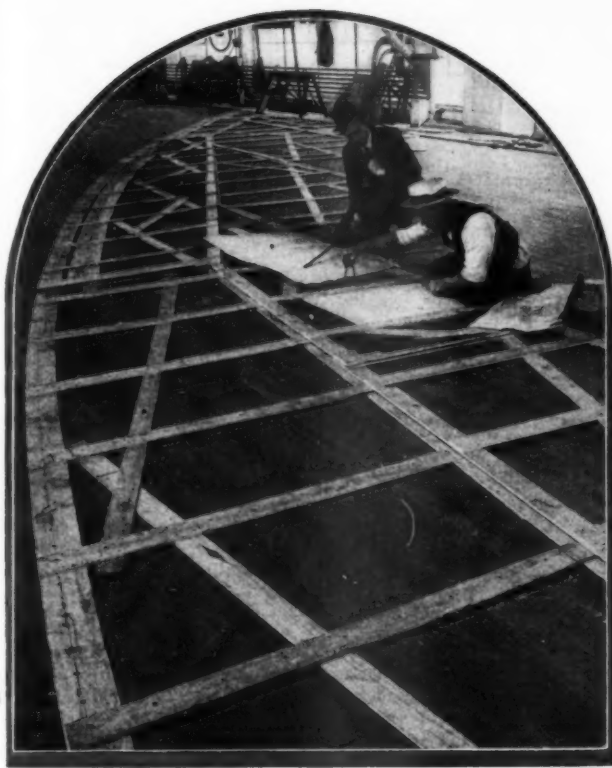
Upon this line perpendiculars are erected carried amply

high to extend above the sheer and spaced as dimensioned on the plan. These are called stations, but also called, variously, frame lines and form lines. These must be square to the base. A sure way to check the absolute squareness of these lines is to measure 4 feet along the base and 3 feet up the perpendicular: a diagonal between these two points will measure exactly 5 feet if the perpendicular is square with the base. This is known as the 3-4-5 method of squaring: 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, or any other multiple of these three numbers may be used.

Above the base line, and parallel to it, be sure to snap in the L. W. L. (load waterline) and W. L. 1A (waterline 1 above) at their

		TABLE OF OFFSETS							
HEIGHTS—	STA.	0	1	2	3	4	5	6	7
BASE TO SHEER	4-6-0	4-4-3	4-2-2	4-0-0	3-10-4	3-10-0	3-11-0	4-0-0	
" KEEL		0-11-3	0-7-0	0-6-2	0-4-1	0-1-7	0	0	
" RABBIT		1-5-2	0-11-5	0-9-3	0-8-6	0-10-7	1-3-0	1-10-0	
" BUTTOK			1-11-4	1-2-4	1-1-0	1-4-1	1-3-2	2-1-6	
" L.W.L.	2-0-0	PARALLEL FULL LENGTH							2-0-0
" W.L. 1A	2-7-0								2-7-0
HALF-BREADTHS									
" TO PECK		1-4-0	2-5-7	3-2-1	3-4-0	3-2-1	2-10-7	2-8-0	
" W.L. 1A		0-7-3	1-10-7	2-10-5	3-2-7	3-0-6	2-2-4	2-4-4	
" L.W.L.		0-6-2	1-6-1	2-6-4	2-11-5	2-7-3	1-10-6	1-2-1	
" BUTTOK	2-0-0	PARALLEL							2-0-0
DIAGONAL									
INTERSECTION—	4' 3" ABOVE BASE LINE, STA. 4								
" AT STA LINE		1-3-7	2-8-4	3-7-2	3-10-4	3-7-3	3-2-3	2-10-3	
STEM—									
SHEER	WL 1A								
STA. 0 TO STEM		0-1-3	0-5-7	0-7-0					
" RABBIT		0-1-2	0-4-0	0-7-5	1-2-5				
STATIONS SPACED	20 SHOWN ON PLAN								

The table of offsets from which the lines of a boat are laid down



The lines should be drawn full size on the loft floor

respective distances (Figure II), 2 feet, and 2 feet 9 inches.

A $\frac{3}{4} \times \frac{3}{4}$ -inch wooden batten, cut from any straight-grained light wood is needed before any of the curves can be drawn. If possible, cut this in one length from end to end of the boat, with a foot to spare at each end, this is for use on the plan view waterlines, the sheer, etc. A second batten will be needed of pliable wood, but of not more than $\frac{1}{8} \times \frac{3}{4}$ -inch and about 6 feet long; this is for the sharper curves of the forefoot and the sections.

The heights from the base line to the sheer are next laid off on each station as given in the Table of Offsets. A fair curving line swept between these points is the sheer. This line is drawn with a heavy batten. Use wire nails for fastenings, but do not drive them through the batten, rather place a nail on both sides at each station line. If the batten lays in a fair sweep without hump or bump pencil it in permanently.

Draw in the shape of the stem to the L. W. L. and then the lower edge of the keel. All these dimensions are given in the Table of Offsets.

Thus we have a full-sized drawing which shows the boat in profile.

As the architect's plans are drawn to a small scale, sometimes as small as $\frac{1}{2}$ -inch to the foot, and as the Table of Offsets is scaled from them, small errors will be multiplied many times over and appear upon the full-sized drawing as large errors, if the Table of Offsets is followed exactly. Be on the watch then for bumps and hollows in all curved lines and shift the batten this way or that way to delineate a fair curve from end to end; keeping it of course as near to the points indicated (as per the Table of Offsets) as possible.

I suggest using an ordinary black carpenter's lead pencil for drawing all the lines that show the profile, including the base line, the waterlines, in this case (Figure II) two, and the vertical station lines.

Now using the base line as the longitudinal centerline of the deck plan, measure off on the station lines the half breadths to the deck line on every station. The half breadths are the distances from the centerline to the deck line, to the W. L. 1A, and to the L. W. L. in Figure II. These dimensions are given in the Table of Offsets.

Through this first line of marks draw a curve, guided naturally, by the ever-needful long batten. This is the

outline of the deck in plan view one side only, to be sure, for but one side only of a boat is drawn ever; the other side being similar in every respect. The W. L. 1A and the L. W. L. are next drawn in fair and true.

It may not be amiss to suggest drawing these curved lines lightly for it may be necessary, I might add probably will be necessary, to change them slightly in order to fair them with the section or body plan lines which will be drawn next. By the way, too, use a red pencil as then the confusion of over lapping and crossing lines will be obviated.

So far so good.

Now, single out station 4, which is the midship section in Figure II, which means that it is the largest in area of all the seven sections. This is the common vertical centerline of the seven cross sections. Take the distance from the centerline to the deck line (plan view); a convenient way to do this is to mark the distance exactly on a straight stick—then transfer it along a line at right angles to the vertical centerline at the sheer. Proceed thus with the W. L. 1A and the L. W. L. Note that the distance from the base line to the rabbet are also given in the Table of Offsets. Take off this measurement at station 4 and transfer it to the vertical centerline but at a distance forward or abaft it, as the case may be, equal to one-half thickness of the keel and deadwood.

Thus we have four marks through which to bend our light batten, and thus we have the exact contour of the midship, in this case, number 4, section. Proceed thus with every other section, drawing the forward ones; numbers three, two, and one at the right of the centerline, and the after ones; numbers five, six, and seven to its left.

Carrying out the idea of using different colors for the three projections, I suggest drawing in the cross sections with blue.

To assure perfect symmetry of the lines so far drawn in their relation to one another buttock lines and diagonal lines are drawn.

A buttock line? It isn't anything new, only a line made by



Templets and patterns are made directly from the lines on the floor

an imaginary vertical saw cut parallel to the centerline of the boat. In the profile view it is a curved line: in the plan view a straight horizontal line: in the cross-section view a straight vertical line.

The distances between the points of intersections of the buttock lines and the cross-sections laid off on their respective stations fore and aft will establish marks to which our heavy batten should sweep in a long fair curve: intersections of the buttock line and the W. L. 1A and L. W. L. on the profile are found by projections from similar intersections on the deck plan.

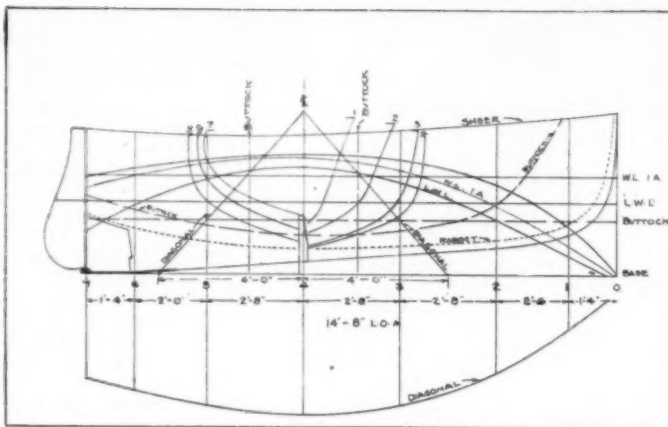
A diagonal is a fore-and-aft line along the middle of the bilge. Usually but two projections are shown—plan and section. In section it extends obliquely from any convenient point on the vertical centerline to any convenient point on the base line, of course straight. In plan view it is a curved line. It is plotted through using the distances from its apex, at the vertical centerline, to its intersection at each station line, on the cross section; these measurements being transferred to their respective fore-and-aft positions on the centerline of the plan view.

Thus, without going into many little details, this is one way in which to lay down lines. Mind though I have used but two waterlines, but one buttock line, and but one diagonal, and a minimum of stations in the drawing, Figure II, feeling that simplicity in the drawing might make the lesson easier to learn. Always four or more waterlines are used, at least two buttocks, and two diagonals. I have found that through spacing the station lines closely at the ends, especially at the bow, and at both ends of a double-ended boat, they assure a shaplier completed boat, simplify the cutting of the rabbets and the shaping of the outdoor portion of the stem—the cut-water.

I might add that the figures given in the Table of Offsets, Figure III, are scaled from a very small drawing and are not intended to be accurate, but merely a guide.

This completes the laying down of the general outline of the stations, of the sheer, of the deck, etc. There are, however, many details to draw in before work may be commenced on the making of the forms, or of cutting out the stem, the keel, the deadwood, and the stern.

The architect's drawings are usually made to the outside of the planking; that being the case it will be



Typical plans of a boat, showing body lines, sheer, waterlines, rabbet, diagonals, etc. This boat has a length of 14 feet 8 inches

the fastenings into the floor.

Rabbet lines for the stem and keel are found in a similar way to this, but in a different manner. But for the time being we shall set the laying out, and cutting of the rabbets aside to take them up at another time, as this operation is somewhat complicated. Special drawings are required and a lengthy description, all of which will appear in the next issue of MoToR BOATING. Amateurs and sometimes professionals are puzzled in developing the shape of a stern transom that is set at a rake. This and the taking of bevels will be treated separately later.

I suggest a study of all the drawings of boat lines that the amateur can find in the boating magazines, for in carefully digesting these many well-worth bits of knowledge will be assimilated which will come in handy at a future time.

Among other things it will be noted that there is no set rule as to which edge of the drawing (right or left) the bow perpendicular is set; some architects seem to prefer the one hand, some the other.

Personally I like to use letters for the station lines, reserving numerals for the frame numbers and dimensions. I have, though, used numerals in Figure II, as this is the usual practice.

Believing that "to learn best, do," I believe it might be

well to "lay down" a preliminary set of lines at a reduced scale say three inches to the foot, and so within a minimum of time and little labor gain more than a passing acquaintance with the subject before proceeding with the real job.

Perhaps I had better stand by now so that you all may assimilate the above instructions on "Laying Down Lines."



The midship section pattern for a large ship

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for August Prize Contest

1. Discuss the starting of two-cycle marine motors, describing why it is that some motors are much harder to start than others, although there is apparently nothing wrong with compression, spark, etc. Give any kinks you know of which are helpful in starting balky two-cycle motors.

(Suggested by W. H. P., Port Elgin, N. B.)

2. Describe and illustrate a most practical flat-bottom tender not over 12 feet in length for use with or without an outboard motor.

(Suggested by C. E. B., Fall River, Mass.)

3. Suggest the most desirable interior arrangement plan for a 40-foot cruiser, using diagrams if necessary.

(Suggested by J. M. B., New York City)

Rules for the Prize Contest

ANSWERS to the above questions for the August issue addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before June 25; (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' name and addresses.

The name will be withheld and initials used. QUESTIONS for the next contest must reach us on or before June 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed \$25, or a credit of \$25 on any article which sells for more

than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG, of which the advertised price does not exceed \$5, or a credit of \$5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Stunt Races I Have Seen

Answers to the Following Prize Question Published in the April Issue

"Describe and illustrate with drawings if possible, what you consider the most novel or interesting motor boat race which you have ever witnessed."

The Slowest Boat Wins

Prize-Winning Answer

USUALLY to the swiftest goes the race, says proverb, but what is novel in a race of that sort? The slow-boat race which one club pulled off one summer was lots more fun and created no end of interest, bringing out perhaps the largest crowd in several seasons.

There were no restrictions placed on the sort of motor boats that could enter this race as all were to have an equal chance. The usual preliminaries, including the firing of the preparatory gun and finally the starting gun, being over, the boats began to get away. On each craft was a man not a member of its crew who was to act as observer. These observers were selected one by each entrant and then were assigned to boats other than those of the entrants who had selected them by the committee. The boats were permitted to run at a speed optional with themselves for fifteen minutes in a direction prescribed by the committee. When this time had been consumed another gun was fired as a signal and a flag hoisted on a flagstaff on the landing near the clubhouse as a signal for the neutral observer to direct the commander of the motor boat on which he was cruising to turn back to the starting point.

No excuse for not turning back immediately and heading directly for the starting point was permitted and the last boat to cross the line won the prize, the next to last was second, and the third to last secured the third prize. The idea was to show just how slow the boats could be run without being retarded by artificial means. Several of those competing stalled their motors and were disqualified, and others were disqualified for violating others of the rules which included failure to turn the boat directly when ordered by the observer; steering an indirect course calculated to take a longer time in returning; stopping the motor for any cause on the return trip, slipping the clutch, throwing out the clutch, tampering with the reverse gear, backing, or towing any object which would retard the speed.

L. G., New Orleans, La.

A Novel Relay Race

RELAY races are not uncommon, but this one in particular was unusually interesting. It was open to all boats enrolled in the club without restriction as to size, power or crew. The boats were divided into four boat teams by the regatta committee prior to the race, and the names of the boats in each team were posted on the bulletin board about two hours before they started.

The committee based its teaming upon the speed of the boats entered, determined by actual performance which had taken place either at a special trial on the morning of the race, or upon its performance at some previous race, if the boat had been in a race held by our club. The committee endeavored to team boats so that the average speed of each team was practically the same. The committee left to the captains of each team the order of starting. Each team was assigned a different color, and the boats in each team had to display at all times a flag furnished by the committee, showing their color. A large flag of the same color was carried and displayed by the one boat in each team that was racing at a particular time, and this flag was passed to the relieving boat within 100 yards of the finish line of each lap.

Boats relieving their team-mates at the end of a lap had to receive the large team flag before the relieved boat had reached the finish line of its lap and follow the relieved boat over this line, when the relieved boat had to drop out. The course was a three-mile-to-the-lap triangular one. The committee boat was the starting and finishing point. Each boat had to go once around the course under her own power, without assistance, and only the one boat that was racing in each team was allowed on the course at one time, except within 100 yards of the committee boat. Rules of the road governed the race.

Variations of this race could be arranged by awarding trophies not only to the winning team but to the one boat in each team making the best time over its allotted course or to one boat in each team that made better time.

C. Q. N., Chicago, Ill.

Light, Strong, Water-tight Removable Cabins

Answers to the Following Prize Question Published in the April Issue.

"Describe and illustrate with sketches the construction of a light removable cabin for use on an open boat, which is of suitable design to carry it."

Built to Stand the Weather

(Prize-Winning Answer)

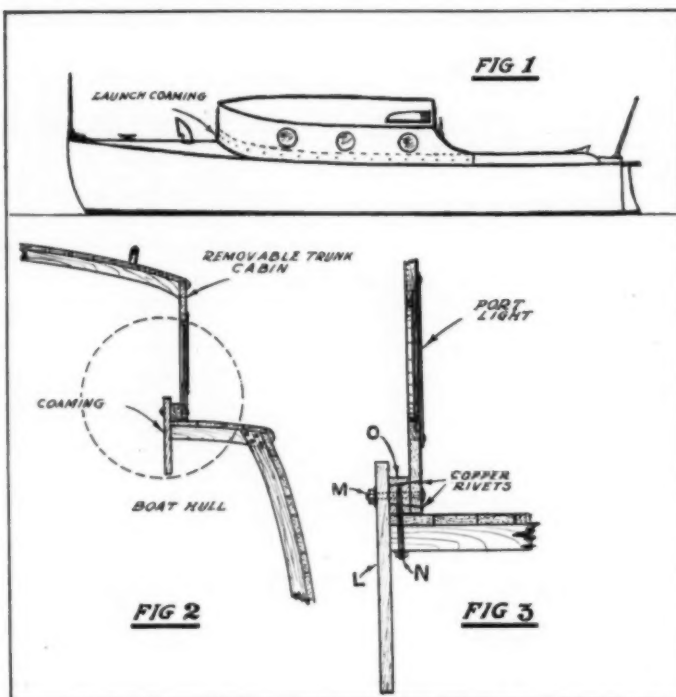
FOR a light-weight, detachable top for an open boat, I would suggest something along the following lines:

The frame consists chiefly of the top and bottom clamps, vertical ribs, nailing strip, and roof beams, all made of oak, well fitted and securely fastened together to form a rigid foundation for the planking. Copper rivets and bolts should be used for these fastenings.

The ribs are $\frac{3}{4}$ inch by $\frac{3}{4}$ inch, spaced about 6 inches centers all around, fastened at the bottom to a clamp outside (which is also the first streak of planking) $\frac{3}{4}$ inch by 2 inches. At the top they are held by the inside clamp $\frac{3}{8}$ inch by $1\frac{1}{4}$ inches, stopping flush with the top of this strip. Over this is fastened a nailing strip $\frac{3}{8}$ inch by $1\frac{1}{4}$ inches, the top outer edge of which is slightly beveled flush with the roof beams so that the planking will fit snug around the edge.

The roof beams are sawed, not bent, from $\frac{5}{8}$ -inch boards, to $1\frac{1}{4}$ -inch depth, with the bottom edges beveled off. They are notched and fitted into notches in the nailing strip, and then fastened. A brass angle can be screwed in the corner as a reinforcement.

The planking can now be put in place, made from $\frac{1}{2}$ -inch to $\frac{3}{16}$ -inch cypress, cedar, spruce, poplar or other suitable thin wood free from knots or imperfections, in strips about 3 or 4 inches wide with the edges planed and fitted tightly for good appearance inside. Fastened with flat-head brass wood screws countersunk just flush.



L. R. K. has his top fit around the outside of the coaming

As shown, this top fits down around the outside of the coaming, and at the top edge of it, inside, a ledge is fastened, notched into each rib (or filler blocks put between the ribs with a continuous strip over it), fastened to each rib and the planking, covering the opening that would show there.

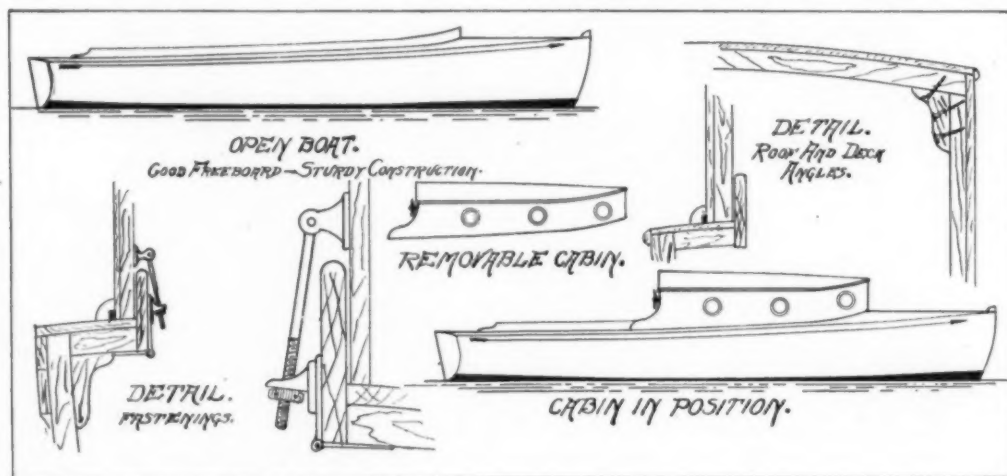
As a reinforcement at the port openings, fit a $\frac{3}{8}$ -inch thick square block with the proper size hole in it for the port.

If the cabin is to be finished bright inside, sandpaper it clean inside, give it a coat of filler and one coat of varnish, then give the outside one good coat of paint, and if any runs through the cracks it can be wiped off the varnish without soaking into the wood inside. The inside can then be given additional coats.

The planking is covered with light canvas or duck, about 6 oz. drawn tight and tacked around the edges with copper tacks. The edges are covered with suitable molding, and the canvas finished as usual.

The after end may be left open, to be closed with a curtain; or it can be partly closed, leaving a doorway over which a curtain roller is fastened to close the door, or an actual door can be fitted, all to the individual taste.

To follow the illustration, a slight addition to the boat is made, being permanent partitions at each side, up to the level of the coaming, with the width of a doorway between, and the top resting on these, gives the appearance of a permanent cabin with doorway. The top is held to these with a simple pin and socket fitting. In constructing the ends of



The cabin illustrated by W. B. M. is intended to preserve the appearance of the boat

the top, between the two ribs forming the doorway, at the top, fit a $\frac{5}{8}$ -inch board with a half round or oval hole in it to form the top of the doorway. This will stiffen considerably the part most frequently handled, and give a good nailing edge for the canvas. When the canvas is on, a thin finishing strip can be bent around the opening, covering the edge of the canvas.

The top is set down over the coaming, and fastened to it with a few brass bolts. If well made, it will stand all the weather you will care for; and no more trouble and little if any heavier to handle than the ordinary 18-foot canoe. Of course it will not stand walking upon. If the top is rather long or wide, the roof beams may need strengthening, but for the ordinary small boat this will not be necessary.

Don't expect to get much headroom, or it will have a box-like appearance and be top heavy in a wind. As it will be mostly used for sleeping purposes, not much headroom will be needed.

L. R. K., Philadelphia, Pa.

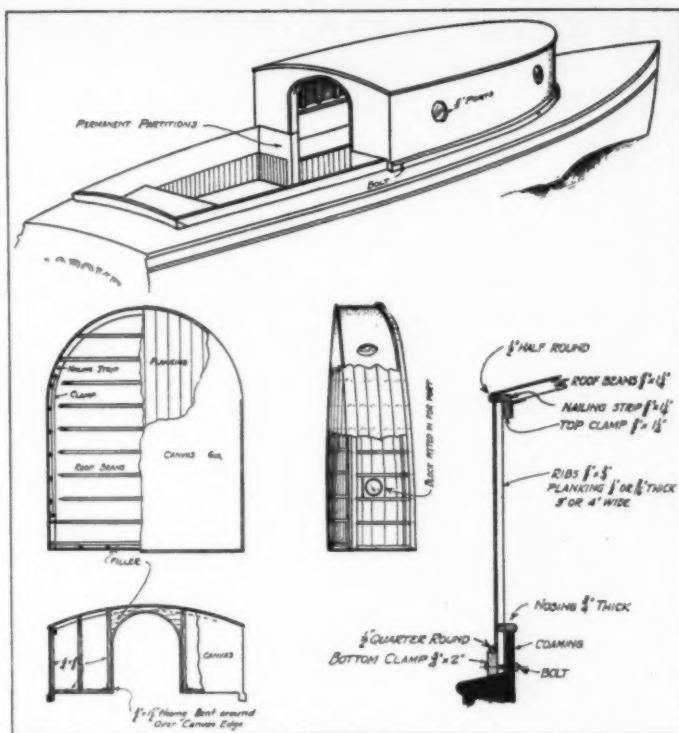
A Trunk Cabin Type

FOR short afternoon and evening trips there is no class of boat that quite equals the open boat, but what manner of man, owner of a motor boat, does not at some time during the season get the cruising spirit and wish that he had a cabin boat; one in which he could take the family and live aboard with all the comforts of home, being assured of a dry warm place to eat and sleep, no matter what the weather or where the location. Most open boats of any type except the runabout class of speeders, have sufficient beam to carry a light removable cabin.

The first step towards the construction is to make your plans deciding on the height and length of the cabin and general method of construction. On a 25-footer the cabin should not be over 18 inches above the deck at its forward end or more than two-thirds the length of the cockpit.

Remember that you must preserve the appearance of your boat and not build a cabin that will look like Noah's ark when finished.

The construction will follow very closely the regular cabin construction. Lift a paper templet of the coaming and laying this flat on the floor build the roof,



R. H. believes an auto top, with slight modifications, could be used advantageously

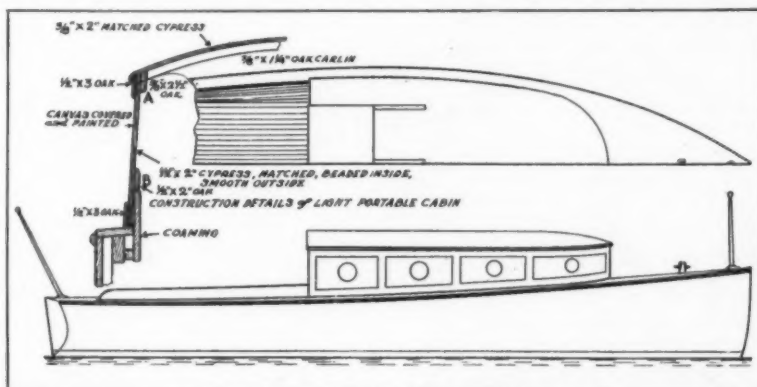
roof tightly stretch and tack light deck canvas, using a quarter-round or half-round molding at the angles or edge as required. To make the joint between the deck and the cabin water-tight place an all-rubber weather strip, or a strip of rubber packing so that it bears firmly on the deck.

The construction is too light to allow a companionway, but the cabin bulkhead will provide the necessary bracing and stiffness at the after end. The bulkhead will extend from under the roof to the cockpit floor, having a door at least 6 inches from the side so that bracing will be possible and a stringer having knee fastenings will extend across the bottom. To hold the cabin firmly in position and to draw the rubber gasket tightly to the deck use skylight fasteners, which are stock hardware. Fasten the plate having the screw part hinged to it to the uprights of the frame and the finger part under which the nut draws may be screwed to the coaming. A much neater job will result if the finger is riveted to a brass or galvanized strap or tee hinge, which is fastened under the deck in such a position that the hinge will turn up against the coaming on the inside to let the fingers engage the nut. By riveting up the hinge pin or making a clip, the hinge, when the cabin is removed, may

be turned back and held under the deck where it is out of sight. Six or eight of these fasteners should be enough.

The finish should conform to the remainder of the boat, but natural finish on such light construction cannot be recommended.

W. B. M.,
Newburgh,
N. Y.



The cabin shown by C. H. C. is intended for a boat with a rounded forward coaming

What Is the Best Arrangement for a 25-Footer?

Answers to the Following Prize Question Published in the April Issue

"Suggest the most suitable interior arrangement plan for a 25-foot cruiser using diagrams if necessary."

A 14-Foot Cabin Forward

THE average 25-foot cruiser will have about 7-foot beam, although sometimes 7 feet 6 inches or 8 feet, if a tubby boat is not objected to, and perhaps 5 feet headroom. Full headroom cannot be had without making the boat in appearance, if not in reality, unseaworthy and topheavy. With the cabin bulkhead 14 feet from the bow, the engine can be under the cockpit with just the flywheel projecting into the cabin, and accessible for starting. If

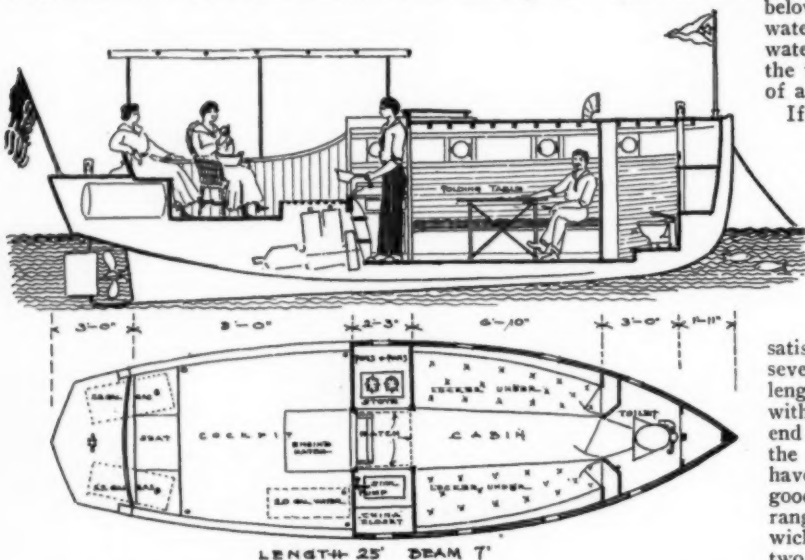
forward over the hatch and forward curtains provided. By using about 2 feet in length for it we still have ample space for the cabin proper and bunks wide enough for comfortable seating and which can be easily extended across the cabin. The toilet door, by the way, should be a Dutch door, giving access through the upper part when the berths are extended.

The galley, as can be seen in the drawings has a sink and china closet to starboard, with an ice-box beneath, and a shelf for a two-burner alcohol stove, with a food locker below, to port. The ice-box being below the waterline has a pan beneath it to catch the water, bad stuff to get into the bilge. On the whole, few 30- or 35-footers can boast of a much better galley.

If the openings above the sink and stove are fitted with copper screens and a cloth screen on a rod provided for the center opening, the cabin is protected from flies and mosquitoes and the nuisance of a complicated screen over the companionway hatch and door avoided.

This arrangement has been evolved after considerable experiment, tried for many years and given complete satisfaction. My wife and I have taken several people with us for cruises of various lengths and one in particular I may mention with another couple for two weeks, at the end of which time, be it noted, that not only the men, but the women also would gladly have extended it to two months. A very good criterion of the comfort of the arrangement. The cockpit, I might add, has wicker chairs and sleeping hammocks for two and with water-tight awning and side

S. L.,
Bayonne, N. J.



S. L. places his galley amidships to secure better ventilation

curtains, may well be considered a part of the cabin.

the cockpit floor is raised well above the waterline, a 6- or 8-inch hatch will take care of the engine, which should have a grating over it, giving protection and ventilation while running, besides the hatch cover.

This leaves us with the forward 14 feet of the boat for our cabin, presumably of the almost universal raised-deck type, and must contain a toilet, cabin with bunks, and a galley. A 25-foot boat hasn't beam enough for a toilet amidships, leaving the bow as the only place. A special fixture is made which fits snug into the lower part of the bow, giving in the flare of the boat above a fair sized space for the compartment.

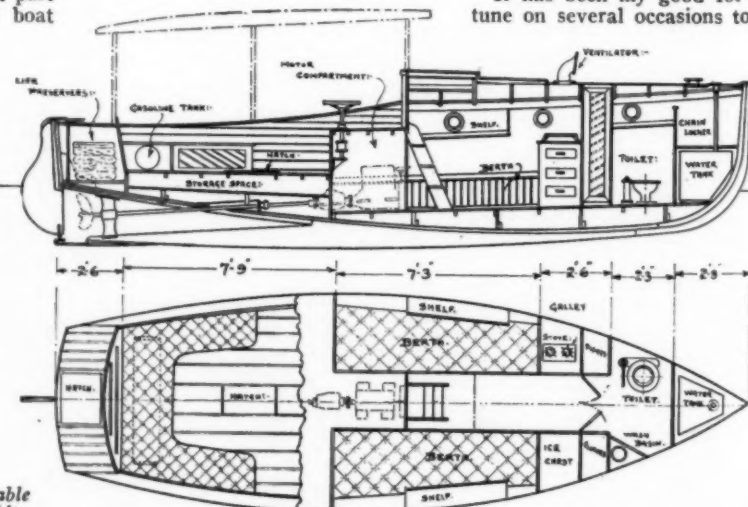
We now have the galley to place and I cannot urge too strongly against the common practice of putting it forward next to the toilet; lack of headroom, poor ventilation and cramped quarters make it impossible to cook a meal in comfort, and it will always be deserted for a hotel ashore when possible, which is not cruising. There is one place for the galley in a small boat and that is amidships under the companionway hatch. It is the point of least motion in the boat, accessible either to the cabin or the cockpit, where most meals are served, has full headroom through the hatch and perfect ventilation is assured even in stormy weather if the cockpit awning is carried

C. E. B. would have a get-at-able motor compartment amidships

A Two-Berth Cabin

FOR the chap who is willing to give up the comforts that are to be found only in a cruiser of greater length than one of 25 feet, there is certainly to be had almost unlimited possibilities and an endless amount of cruising fun even with a craft of this size just as long as inflated ideas of those possibilities are not maintained.

It has been my good fortune on several occasions to



share in little trips with a friend, a real boatman and ardent enthusiast, who is the proud possessor of a little cruiser of exactly 25 feet overall. This little cruiser is all that is to be desired for fulfilling the owner's requirements and many are the enjoyable week-ends and holidays that have been spent within her limitations.

From my observations while aboard the above mentioned little boat were I to go in for a cruiser of this size I believe an interior arrangement in accordance with the accompanying plans would be one that would appeal to me. Omitting all unusual and freak features, I would aim for a sensible combination and well-balanced and thoroughly practical design. In brief a snug little cruiser with only necessary accommodations and conveniences. As is the usual practice well up forward would be placed the fresh water tank properly protected and surmounted by the chain locker. Next to this space would come the toilet room adjoining the cabin proper. The cabin would be provided with a berth on either side aft and small galley arrangement conveniently laid out forward.

In the amidships section housed beneath the short bridge deck and so arranged as to be positively get-at-able and also allowing for proper means of ventilation, would come the motor compartment.

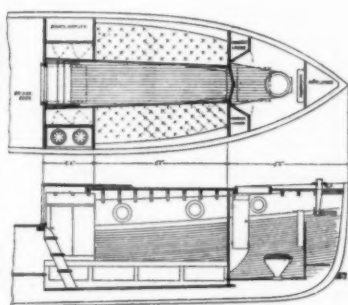
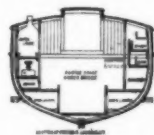
The cockpit would be provided with side and back seats and beneath the latter extending across ship would be mounted the gasoline tank of ample cruising capacity. Space permitting below the cockpit floor a false floor or slat grating would be laid and the space between utilized for storage space for equipment and duffle not easily spoiled. Below the extreme after deck would come the built-in locker shown. Here the life preservers, ropes, and other spare articles of equipment also could be neatly stored to advantage.

The foregoing brief description if taken together with the arrangement drawings will without a doubt serve as a guide in planning a most desirable interior arrangement for a 25-foot cruiser.

C. E. B., Fall River, Mass.

A Boat with Removable Parts

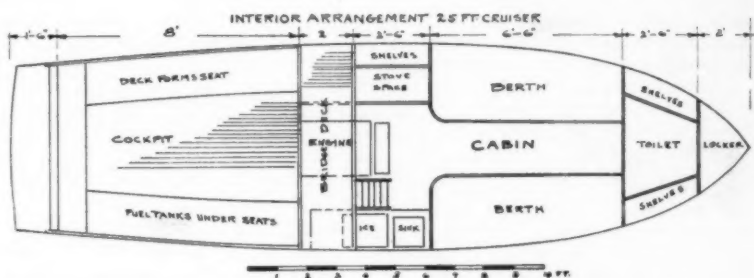
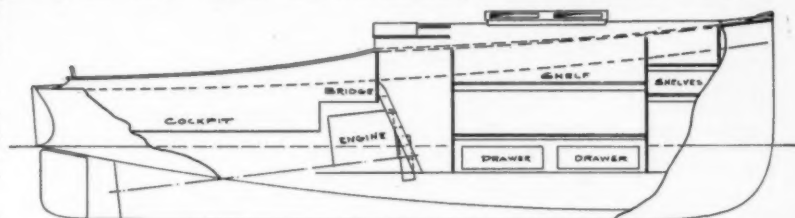
THE accompanying plan of interior layout for a 25-foot cruiser will show, I believe, the most convenient and practical arrangement for a boat of this size. Forward is the fresh water tank which is piped to the galley and wash basin, and is filled through pipe with flush screw plug in deck. Above the tank is a space in which to coil anchor cable with suitable hatch in deck. A removable partition in sections divides this from the toilet room which has besides the closet, wash basin with pump arranged to draw water from the tank or from sea, mirror, shelves, and towel holder on the port side and hooks to hang oilskins, etc., on starboard. A partition with a door separates the toilet from the galley and cabin. On the port side of the galley is a two-burner oil stove with lockers under for provisions, etc., and above some shelves and hooks. The starboard side



C. H. C. has his motor under a low bridge deck, easily reached

has the ice-box with sink over and dish rack above. A pump is attached to partition and discharges into sink, and a three-way valve allows water to be pumped from the tank or from sea.

The cabin transoms are 6 feet 6 inches long and are provided with pull-out extensions making comfortable sleeping quarters. Under each is a drawer locker and above and out of the way is a shelf. At the after end of the cabin two full length clothes lockers are arranged with doors opening over transoms. Removable steps between these lockers lead up to the top of the engine housing which is slightly higher than the top of the engine making a convenient step down to the cockpit floor. This housing has a hinged top covered with pyramid rubber matting bound with angle brass edge. The entire housing, which has ventilated sides, and part of the flooring in the form of flush hatch can be quickly removed when it is necessary to make repairs on the engine.



C. D. provides for a roomy cockpit with a floor above the waterline

The rear-hand starter comes up at the after end of the housing, and the reverse lever control, steering wheel, binnacle, spark, gas, switch, etc., are on the cabin bulkhead at the port side. A ring life buoy with the boat's name, port, and flags painted on is hung below the wheel on the bulkhead.

The water-tight cockpit is self-bailing and has side seats with gasoline tanks under, and a cross seat at the stern with removable top and back to give access to space under and to rudder gear.

R. S. D., Toronto, Ont., Can.

A Design Which Has Proven Satisfactory

WHILE there are as many tastes in interior arrangement in a motor boat as there are men who own them, and probably no one arrangement would suit any two men, I have endeavored, in the accompanying sketches, to show an arrangement that has worked out very well in practice and will comfortably accommodate two persons for a long cruise without undue crowding and yet provide for a reasonable amount of dunnage, equipment, and food stuff.

Since one is out in the cockpit most of the time I have shown plenty of room here. The cockpit floor has been kept well above the waterline so as to be self-draining. In the cabin itself are two berths 6 feet 6 inches long and approximately 2 feet 6 inches wide. Two fairly large drawers are provided under the berths, and a shelf above on each side for small things. A small sink and ice-box are on the starboard side, with stowage for tinware under the sink space. There is a stove space on the port side, extending under the bridge deck, with stowage space underneath and shelves above on both sides for dishes or light canned goods. The engine has been placed under a small bridge deck

which keeps the greater part of it out of the cabin. This bridge deck allows for a strong beam across the middle of the boat, and lends strength. Entrance is provided into the cabin by a small removable ladder on the starboard side. The companionway being above the galley will help draw out engine smells and cooking odors. I would suggest a case be built over the flywheel to prevent clothing being caught in the wheel.

There is about 5 feet headroom in the cabin, except under the skylight where there is full headroom or almost 6 feet. Located forward is a toilet which may be used also as a place to hang oilskins, coats, etc., and has two shelves on each side. Forward of the toilet, in the very bow, is a locker large enough to stow a spare anchor, rope, etc.

The gasoline tanks are located in the cockpit under the seats on each side and if desired could be provided with pans underneath to drain overboard in case of leakage. By keeping the fuel outside of the cabin altogether there is considerably less danger of fire, and apt to be less piping trouble on account of the shortness of the pipes leading to the engine.

A port-light in each side of the toilet should be provided for ventilation, as should at least two others in the cabin itself.

The boat is 25 feet long, 7 feet 6 inches wide, and about 2 feet 6 inches draft. Of course in a boat of this size it is difficult to incorporate the extra locker room and comfortable accommodations that can be had in a 40-footer, but the layout shown in the sketches has been in successful use on several boats and found to be very satisfactory.

C. D. D.,
Philadelphia, Pa.

Designed from a Boat Now in Use

AN average 25-foot cabin cruiser would have a beam of from 6½ to 7½ feet. About 4 feet 6 inches headroom is possible without going to extremes in the way of freeboard. A good sized cockpit is required, so about 14 feet is usually all that can be allowed for a cabin in a 25-foot boat.

The plans show one that was built on a boat with 6½ feet beam and will give an idea of what can be done in a small space when necessary. This cabin has been in use for several seasons and I can hardly see how the space available could be used to better advantage.

Beginning forward there is a good sized rope locker for the anchor lines. Then comes the toilet room. This is separated from the main cabin by a light bulkhead and double doors. Two small hanging lockers are arranged at either side and a good many things are usually hung outside of the lock-

ers, a common habit of yachtsmen. A folding basin is attached to the bulkhead forming the rope locker. Besides the two 5-inch port-lights there is an 18-inch hatch which provides good ventilation and on occasion—extra headroom.

Next comes the main cabin, which is 8 feet 6 inches long. There are two 6-foot transoms which may be converted into good berths by extending a few inches on a few occasions when weather conditions proved too severe for sleeping in the cockpit. We simply bridged across between the two transoms, converting them into a wide double, or I might say triple, berth.

When this boat was being finished, it looked for a time as though the galley would be crowded off the boat entirely.

However, the plans were finally worked out so a space of two feet fore and aft was allowed on either side for the cooking outfit, dishes, and provisions. The ice-box was located in the cockpit.

This does not look like a large amount of room and someone has said that a galley should not be located on both sides of the boat. However it can be arranged that way if the boat is not too beamy. Two lockers about a foot deep were built extending from the transom to the cabin roof. One of them was metal lined and arranged to hold two Primus stoves. A 3-inch stack or ventilator was provided in the roof to carry off smoke. The other locker was arranged with suitable shelves for the plates, cups, and other dishes, cans, etc., and as these shelves were not the full depth of the locker, there was room for a small zinc-covered work table to fold up inside where it would be out of the way, but ready for immediate use when wanted.

The engine is located under a low bridge deck where it is easily reached either from the cabin or through hatches in the bridge. The companion steps are in the center over the fly-

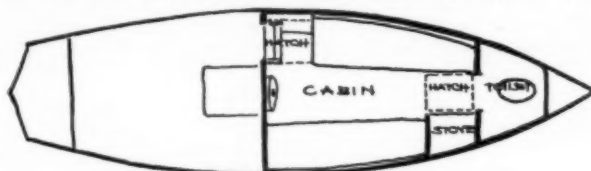
wheel and are easily removed when work is to be done around the engine.

The locker under the transom is left open for a space of about two feet on either side. One contains the storage battery and other equipment, and the other is used for tools. The other lockers, extending about 6 feet on either side, are closed and are used for storing blankets, clothing, etc.

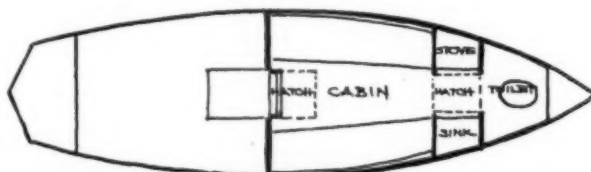
One must bear in mind that this design is not a theory but a fact. These plans and specifications come from a boat already built and in the water, not from the imagination of

some amateur boat builder and so should carry a certain amount of authority that they would not otherwise possess as to their practicability. The advantage of this is that changes which might be necessary in designs before construction have been made.

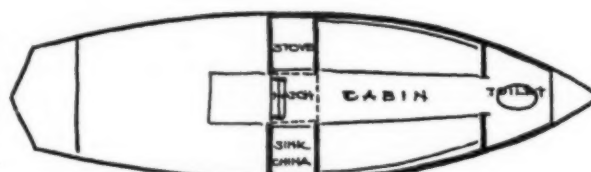
C. H. C.,
Saginaw, Mich.



SOME SPACE WASTED - GALLEY POORLY PLACED, TOO SMALL AND WITH POOR VENTILATION.

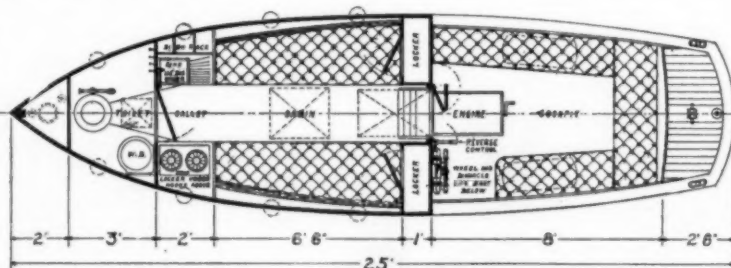


BETTER ARRANGEMENT BUT SAME OBJECTION TO POSITION OF GALLEY.

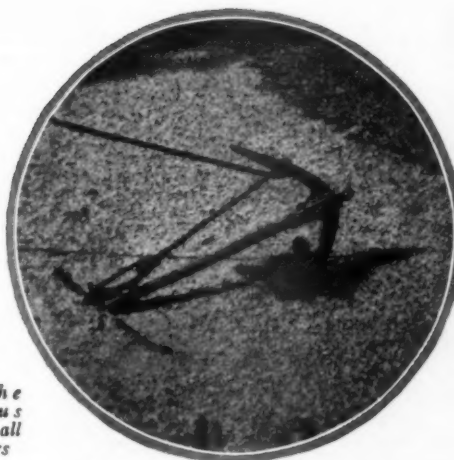


GALLEY AMPLE, CONVENIENT AND WELL VENTILATED AT ALL TIMES.

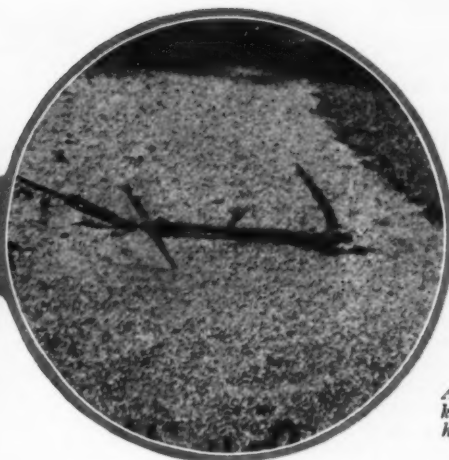
S. L. gives examples of galley arrangements, illustrating the best position



The cabin transoms of R. S. D.'s design are 6 feet 6 inches long, and provided with pull-out extensions



Fouling — the one serious trouble with all fluke anchors



A well bedded kedge anchor has good holding power

Making the Anchor Hold

THE ground tackle may not be quite as important an item of equipment aboard a motor boat as on a sail boat, but those who have had much experience in cruising or consider the safety of those aboard will play safe and always have with them an anchor and cable that will safely hold their craft should the need arise. The sail boatman readily appreciates the need of an anchor that will hold. When he is caught in a blow he cannot always choose his anchorage so goes prepared for the worst.

The motor boatman can generally manage to make a more or less protected anchorage, whether to windward or leeward, and in a pinch can even keep his motor going while riding out a gale. This is not very good practice and to have a motor running all night to keep the anchor from dragging is by no means a pleasant experience. Far too many motor boatmen rely on making a protected harbor and depending on a light anchor. To be sure a light anchor is easier to handle, and is all right for all ordinary occasions, but why not carry a heavy anchor and stout cable stowed away under the floor or in a locker? Then you need not worry when the clouds go scudding by overhead and white caps top the waves.

As to the best type of anchor probably few will agree and what is more important some anchors will hold better in one kind of bottom than another. Then again some are easily tripped by the cable while others require a much larger scope if they are to hold securely.

Before going any further into the subject it might be well to stop and consider just how and why an anchor holds. All anchors are so shaped that when they land on the bottom they roll over until one fluke is pointing downward. This first sinks through the soft material that nearly always forms the surface of the bottom and then gradually works itself down

Some Types of Anchors and How They Are Used

into the harder material below.

This process of working down into the bottom will not take place unless the fluke stands at a slight angle toward the boat, and anchors are so designed that this angle is attained when the shank lies flat on the bottom. Now, to have the shank lie flat, the scope—length of cable paid out—must be considerable or the head of the anchor will be raised every time the boat pulls on it. Raising the head of an anchor has the same effect as raising the handle of a pickax when the point is driven into the ground. It breaks up through the surface with ease and loosens the surrounding material, thus allowing the anchor to drag. Once an anchor begins to drag it almost always fails to take hold again. It simply digs a furrow in much the same manner as a plow. But once an anchor has a firm grip on the bottom the jerking and pulling of the boat on the anchor cable simply makes it dig deeper and deeper into the bottom, and cases have been known when an anchor in a sandy bottom has been completely buried, flukes, shank, and stock, during a blow.

Without question the best all-around anchor is the old-fashioned kedge. These anchors have been used for centuries. First with wooden stocks, then iron stocks and now with sliding stocks that fold in against the shank. The one great objection to the use of these anchors for small boats is the difficulty of stowing them away. This is overcome in some of the newer patterns in which both the stock and flukes fold against the shank. Another bad feature is the danger of fouling the cable on the upstanding fluke as the boat swings with the tide or wind and thus tripping it and breaking it out.

The stockless anchor overcomes the danger of fouling and tripping but as the flukes are shorter they do not hold as good as a kedge of equal weight. Then



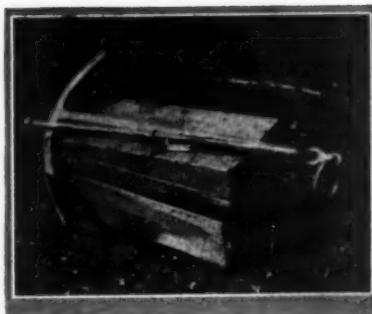
When once an anchor begins to drag it acts like a plow and will not hold until it is raised and dropped again



Where there is danger of the anchor becoming jammed, it is well to have a trip line fast to the crown

too, the crown is bulkier and generally will not be buried as deep as a kedge anchor. As a general rule stockless anchors require a longer scope and the short flukes have a greater tendency to plow through the bottom than with kedge anchors.

The poorest holding anchor under ordinary conditions is the grapnel. These anchors have their use too. When tied up to the bank of a canal or to hold a line on a marshy weed covered bank, they are without an



Of all the different types of anchors, there are few that equal the old-fashioned kedge for holding qualities. The sizes suitable for small boats are made with folding stocks in order that they may be more easily stowed away

weighs one and one-half or one and three-quarter pounds for each foot of length of the hull—but never less than twenty-five pounds—will prove sufficient for all occasions. An anchor under twenty-five pounds in weight is too light to dig into the bottom unless it is very soft.

Cruisers or cabin boats should carry two anchors, a light one for general use and a heavy one for



The stockless anchor is without doubt the most convenient pattern to handle and there is no danger of accidentally fouling the anchor and tipping it



For a permanent mooring in any but a rocky bottom, the mushroom is supreme



The anchor which can be most readily stowed away in the small boat is the newer pattern of kedge with folding flukes and stock



equal. For a permanent mooring in any but a rocky bottom the mushroom anchor is supreme. When once well buried they are immovable—without pulling up hundreds of pounds of the bottom with them. On a rocky bottom a concrete or stone block of great weight is about the only thing that will hold.

The size and number of anchors carried by a boat will depend much upon the type of hull. A shallow draft, beamy, high-sided boat is extremely hard on the anchor as it is tossed about by the wind and waves while a deep, narrow low boat will ride steadier and cause less strain on the ground tackle.

For a light openboat or runabout an anchor which

the exceptionally hard bottom that is sometimes encountered and on which you can depend during that severe blow every boatmen will sooner or later be caught in. The light anchor should weigh from one to one and a quarter pounds for each foot of length of the hull and the heavy one two pounds per foot. Some men prefer three anchors of about one, one and a half and two pounds per foot but the medium one can easily be dispensed with and thus save space and weight.

The choice between chain and manila rope for the anchor cable is about the same as the choice between a kedge and stockless anchor. They both have good points and disadvantages. A chain is easily stowed away, does not need to be dried and will not become weakened by rot. It is heavier to handle and when anchored in a heavy sea will bring the boat up with a jerk as it is not elastic. A chain does not tend to lift the head of the anchor as much as rope.

Manila rope when used as an anchor cable should never be stowed away when wet. It should be faked down on the deck

until dry or its life will be short. Wet rope stowed

(Continued on page 58)

My Ideal Auxiliary

No. 5, Pirate II—A 60-Foot Great Lakes Auxiliary Ketch

By E. M. Murphy

As usual, the love and respect which a yachtsman entertains for his first Ideal craft is cooled in a season or two. Living up to this never-failing rule, the accompanying design is the result of the dissatisfaction which gradually turned to disgust with us for Pirate I. Hence Pirate II.

During the early stages of our development as yachtsmen, a set of conditions became apparent to our minds, which promised the utmost in pleasure and which Pirate I could not fulfil, that is, the run from Rocky River to Put-in-Bay or Cedar Point for the week end in a boat that could get us there and back in fair weather or foul. Also as we progressed in age and experience we took unto ourselves wives and sweethearts, accommodations for whom had to be provided. Added to these were the annual regatta week at the Bay and the annual cup races in the Detroit River, two very pleasant and lively excursions, so it became apparent at once that a larger craft, with accommodations of real privacy and good galley and saloon facilities was required. After inspecting, measuring, and sketching everything in cruisers within trolley distance of Cleveland, it was decided that a 60-foot boat would fill the bill. Also we made up our minds that it was to be auxiliary rigged, preferably a ketch, and the engine (for financial reasons) would have to be the six-cylinder medium-duty plant taken out of the original Pirate. Added to the above requirements were plenty of freeboard, a good beam with as easy a bilge as was consistent, not too bluff in the forward sections, no centerboard and still not an excessive draft, and finally quarters for one or two men, depending on the length of the cruise.

While one of the crew had a working knowledge of naval architecture, a yacht is an altogether different proposition from a liner or destroyer, so the first article purchased for the new boat was a copy of Skeene's Yacht Designing. This, in conjunction with such published particulars of dimensions, lines, and forms of the ketch type of auxiliary, enabled us to block out a set of dimensions and try the different schemes of arranging quarters until after several alterations the accompanying plans were developed.

Forward is the chain locker, separated from the crew's quarters by a stout bulkhead. In the crew's quarters are arranged

accommodations for two men on pipe berths. A double bulkhead, separated 19 inches, allows room for locker space for the crew as well as opening into the main saloon, giving additional locker space there.

In the layout of the main saloon, the berth seats and tables were laid out in the usual way. However, the space under the deck above the seat back is closed in to form locker space. The cross section at No. 4 ordinate illustrates the method used in building these lockers and their location. They will be found very handy for stowing dishes, utensils, cameras, etc. In a pinch the main saloon could be used to sleep six men. With this idea in view the skylight was arranged to open on the saloon as well as in the passages and staterooms.

The private staterooms are about amidship where we have the greatest beam. The berths are raised from the floor about 3 feet 3 inches. By keeping them raised it was found possible to secure a little better ventilation and it also gave room for three good-sized drawers under.

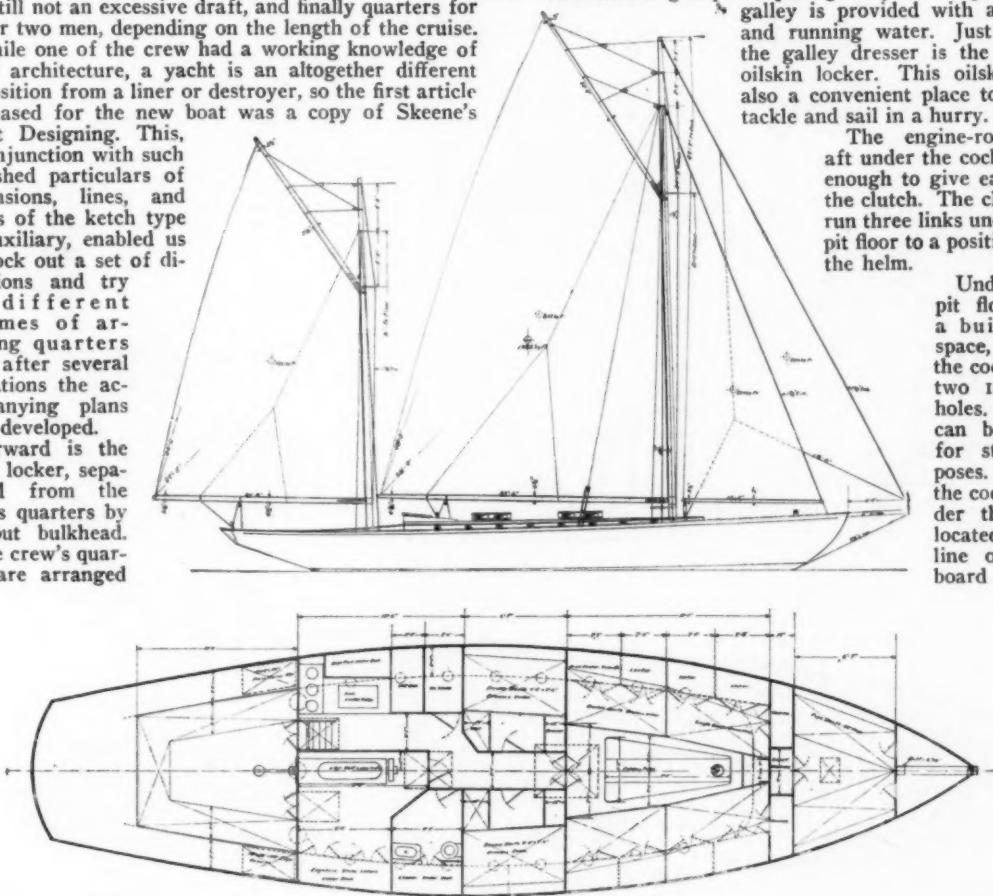
Aft of the starboard stateroom is located the toilet and lavatory space. A fixture suitable for below waterline use is to be installed, as well as a wash bowl.

In the after end of the cabin and extending under the cockpit is located the engine compartment, etc.

The space abreast of the engine is divided by a longitudinal bulkhead fitted within a close distance of the engine, forming a separate engine-room on the starboard and a combination galley and passage way on the port side. The galley is provided with an oil range, and running water. Just forward of the galley dresser is the ice-box and oilskin locker. This oilskin locker is also a convenient place to store spare tackle and sail in a hurry.

The engine-room extends aft under the cockpit floor far enough to give easy access to the clutch. The clutch lever is run three links under the cockpit floor to a position alongside the helm.

Under the cockpit floor there is a built-in locker space, opening to the cockpit through two 18-inch manholes. This space can be used also for stowage purposes. Alongside the cockpit and under the deck are located the gasoline on the starboard and fresh-



Sail plan and interior arrangement plan of Pirate II.

TABLE OF OFFSETS																			
STATION	HALF BREADTHS										DIAGONALS				HEIGHTS				
	SKEL	KEEL	WL-35	WL-45	WL-55	WL-65	WL-75	WL-85	WL-95	WL-105	No. 1	No. 2	No. 3	No. 4	KEEL	SKEL	1'-BUT	2'-BUT	3'-BUT
0	3-0-7	—	—	—	—	—	—	—	—	—	3-2-1	2-7-3	0-9-4	—	6-0-0	10-0-0	6-1-0	6-1-0	10-4-0
1	4-10-4	—	—	—	—	1-1-5	2-5-4	3-4-2	4-0-6	5-1-4	4-6-8	2-4-5	—	4-3-8	10-3-6	4-11-0	5-7-0	6-5-6	1
2	5-1-6	—	—	—	—	1-8-6	3-2-4	4-6-7	5-3-4	6-2-0	6-7-1	3-11-3	3-6-0	—	3-1-3	10-3-2	3-7-4	4-1-4	4-8-4
3	7-0-9	—	—	—	1-11-1	3-0-3	5-2-0	6-0-4	6-6-3	7-4-4	6-11-7	4-6-0	0-11-5	—	2-0-2	10-0-6	5-6-4	3-0-3	3-5-3
4	7-8-1	0-8-0	0-7-3	1-4-4	3-4-7	5-0-0	6-4-8	7-0-1	7-4-4	7-6-3	8-7-6	7-8-0	5-0-8	1-8-2	0-2-4	9-10-8	1-8-0	2-4-1	2-10-2
5	8-0-1	0-7-0	1-0-0	1-10-8	4-0-0	5-0-1	6-11-4	7-6-3	7-9-4	7-10-1	9-1-2	7-11-4	5-4-0	2-0-1	0-0-0	9-9-1	1-1-0	2-1-3	2-6-4
6	8-1-3	0-10-0	1-0-0	1-10-1	3-9-5	5-0-3	6-10-5	7-1-2	7-10-6	7-11-6	9-1-3	7-11-3	5-3-5	1-11-2	—	9-8-0	1-0-6	2-2-0	2-9-0
7	7-11-3	0-8-5	0-10-3	1-3-8	2-9-1	4-11-6	6-6-0	7-2-4	7-7-4	7-9-8	8-8-4	7-7-2	4-11-0	1-0-6	—	9-7-2	1-5-8	2-7-3	3-1-2
8	7-6-8	0-6-3	0-7-3	0-8-4	1-3-0	3-2-7	5-2-8	6-4-0	7-0-2	7-4-4	7-11-4	6-10-4	4-1-5	1-0-7	—	9-6-7	2-5-4	3-6-4	3-11-4
9	6-10-5	0-3-3	0-4-6	0-4-4	0-6-6	1-7-0	4-8-2	5-10-6	6-7-3	6-11-3	5-8-6	2-10-3	0-8-4	—	BELOW	9-6-6	4-3-0	4-10-0	5-2-4
10	6-1-1	—	—	—	—	—	0-4-0	3-11-2	5-4-2	5-9-3	4-3-3	1-2-5	—	—	6-0-0	9-8-0	6-1-0	6-4-0	6-7-4
11	5-1-7	—	—	—	—	—	—	—	3-0-4	4-6-0	5-8-5	—	—	—	—	9-9-6	7-8-0	7-9-7	8-0-4
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8-8-0	10-0-0	8-9-0	9-0-1
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

ALL DIMENSIONS GIVEN IN FEET, INCHES AND EIGHTS TO OUTSIDE OF PLANKING.

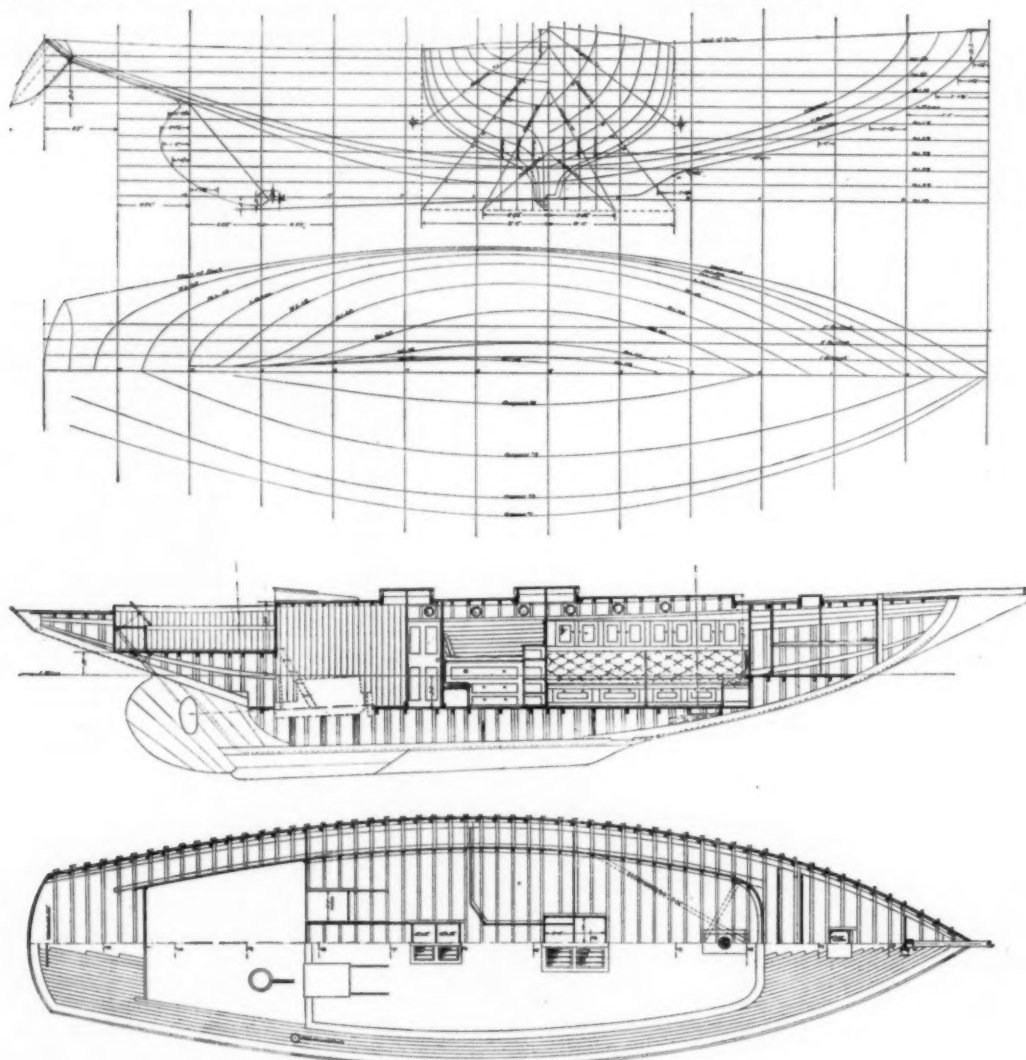
water tanks on the port side. A 50-gallon tank is provided, but larger may be installed provided the relative positions of the center of gravity and the center of buoyancy are not altered appreciably.

The original design of the hull called for a mahogany finish in the cockpit, mahogany and white enameled agasote paneling in the quarters, white pine with white enamel finish in the galley and crew's quarters and lavatory and grey enamel finish in the engine-room.

The rigging and sail plan shows a set of canvas of about

the proportions 1—3—1. This seems to be the relations of the areas of the two jibs. Mainsail and spanker that is followed by the best designers, and it also gives a convenient rig to handle. The vessel is not over canvassed, as it was expected that 40 h.p. delivered by the engine would be capable of driving the ship 8 miles an hour. The crew had the opportunity of running the model in the University of Michigan Model Basin and the resistance curve is given, as it may be of use to amateurs who are contemplating the

(Continued on page 58)



Lines and details of the sixty-foot auxiliary ketch

AMERICAN MARINE MOTORS

The 40 H. P. Valve-in-Head Knox

NEXT to reliability in operation, the most important feature in marine motors is accessibility of the various parts, whether of the motor itself or the accessories. As to the reliability of the Knox marine motor built by the Knox Motors Co., of Springfield, Mass., it is sufficient to say that it is in every way up to the high standard set for all their products. Every part is manufactured from the material best suited for that particular purpose as proven by actual service and many years of study and investigation.

The 1919 Model of the Knox 40 h.p. valve-in-head marine motor is in general the same as the 1918 Model, the differences being in the nature of refinements rather than radical changes. Every effort has been made to reduce the number of parts to a minimum and arrange them in such a way that they are all readily accessible.

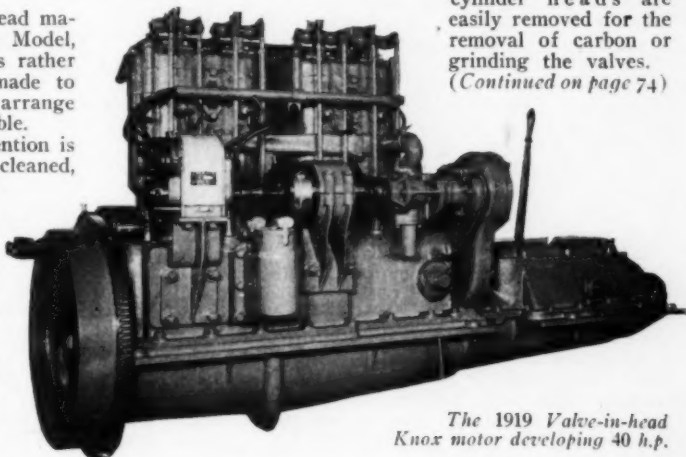
Every part of the power plant that requires attention is located well above the bed plate where it can be cleaned, adjusted, etc., after the motor has been installed in a boat. The water pump, generator, magneto, and starter motor are all mounted above the crankcase. The oil pump is a real novelty. The pump and strainer are located in the vertical cylindrical casting located just below the forward end of the generator. By removing the three wing nuts on top of the casting the strainer can be removed for inspection or cleaning. Should it be desirable to remove the pump, it is only necessary to take out four bolts. The pump, strainer, and drive gear can then be withdrawn from the crankcase. There are no pipe connections to be broken as the oil passages are cored or drilled in the

crankcase. In fact, the only oil pipe on the entire motor is one leading from the crankcase to the accessory shaft drive gear bearing, and there are no grease cups at all.

Another feature of the motor quickly appreciated by those who have had experience is the absence of valve cages with the necessary gaskets and lock nuts. In the Knox motor the cylinder heads contain the combustion chamber and gas passages to the manifolds. The valves seat directly against the under side of the head casting. The

cylinder heads are easily removed for the removal of carbon or grinding the valves.

(Continued on page 74)



The 1919 Valve-in-head Knox motor developing 40 h.p.

The Standardized Universal Motor

THE Universal marine motor is all that its name implies. It is truly a universal power plant for any light-built pleasure or commercial boat not over 30 feet in length. The size of this motor, 9-12 h.p., makes it a very popular model for the average small boat.

The entire power plant, with the exception of the carbureter and ignition apparatus, is built in the plant of the Universal Motor Co., of Oshkosh, Wis. Having devoted their entire attention to but one size and model of engine for several years, the manufacturers have developed and perfected each detail to a much higher degree than would be the case if they were working on several sizes and models.

With a bore of 2 5/8 inches and a stroke of 4 inches, this little motor will develop from 9 to 12 h.p. at speeds from 1,200 to 1,600 r.p.m., making it a particularly desirable motor for

small, fast boats. Although this is essentially a high-speed motor, it can be operated on kerosene without changing the carbureter, the only change in the equipment being a hot-air drum on the exhaust pipe and a flexible tube connecting it with the carbureter.

The four cylinders are cast en bloc, with the inlet and exhaust manifolds and upper half of the crankcase integral therewith. The cylinder heads are also cast en bloc, but are separate from the cylinder and contain the combustion and valve chambers. The joint between the cylinder and cylinder head castings is made tight by means of a copper-asbestos gasket which assures a tight joint.

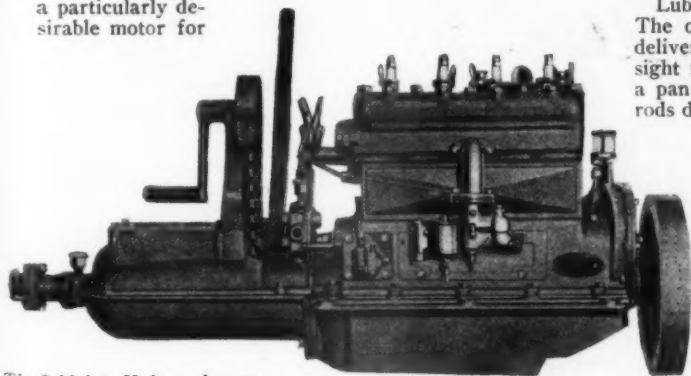
The crankshaft, camshaft, and connecting rods are of drop-forged steel carefully machined and with all bearing surfaces ground accurately to size. The reverse gear is of the multiple disc type with bronze bushed hardened steel gears.

Lubrication is by means of a circulating splash system. The oil is drawn from a sump by a plunger pump and delivered into the gear case at the forward end through a sight feed. After flowing over the gears the oil runs into a pan with troughs for the oil into which the connecting rods dip. From the pan the oil runs back to the sump to be again taken up and circulated by the pump.

The standard ignition equipment is the Atwater Kent system, but a Bosch DU-4 magneto will be supplied at a slight increase in cost when desired. The Mayer carbureter is used exclusively, as it gives very good results and great economy and will handle either gasoline or kerosene.

There are several details in the design of this motor that are rather unusual in an engine of this size. The pistons are provided with three rings at the top and directly under the bottom

(Continued on page 74)



The 9-12 h.p. Universal motor

Hints on Keeping the Motor in Shape

No. 1—The Sterling Engine

IT is a safe conjecture that if the modern power plant was given the reasonable amount of care and attention it requires, the resultant efficient operation would not only redeem the effort in increased satisfaction, with interest, but would add materially to the life of the engine. No matter how careful a manufacturer has been to provide for all contingencies in the design of his motor, complete freedom from annoyance is the reward only of the man who keeps his motor in proper working order, and adjusts little difficulties before they become too serious. It will be noticed that the following suggestions for upkeep of your Sterling refer chiefly to the installation, which, if faultless, immediately eliminates practically all difficulties.

In so far as Sterlings are concerned, and the same is true of any other motor, the care of the engine begins with the washing off of the heavy slushing oil and grease with which polished surfaces have been coated to prevent rust in transit. This should be done as soon as the engine has been installed, using gasoline, and the parts should be wiped clean with rags, not waste. Never use waste on a gasoline engine, as threads are liable to get into the oil lines and clog the oiling system.

When the engine has been placed in the boat and before bolting to the engine bed, the lining of the shaft should be determined. If the engine is placed with the supporting lugs resting on flat iron plates, a better and more permanent alignment can be secured. The faces of the flange coupling which attach the engine and propeller shaft should line true, that is, they should be perfectly parallel before being bolted together. This can be determined by sliding a strip of paper between the coupling faces at various points while rotating the shaft. If the paper is gripped uniformly, the coupling can be bolted together.

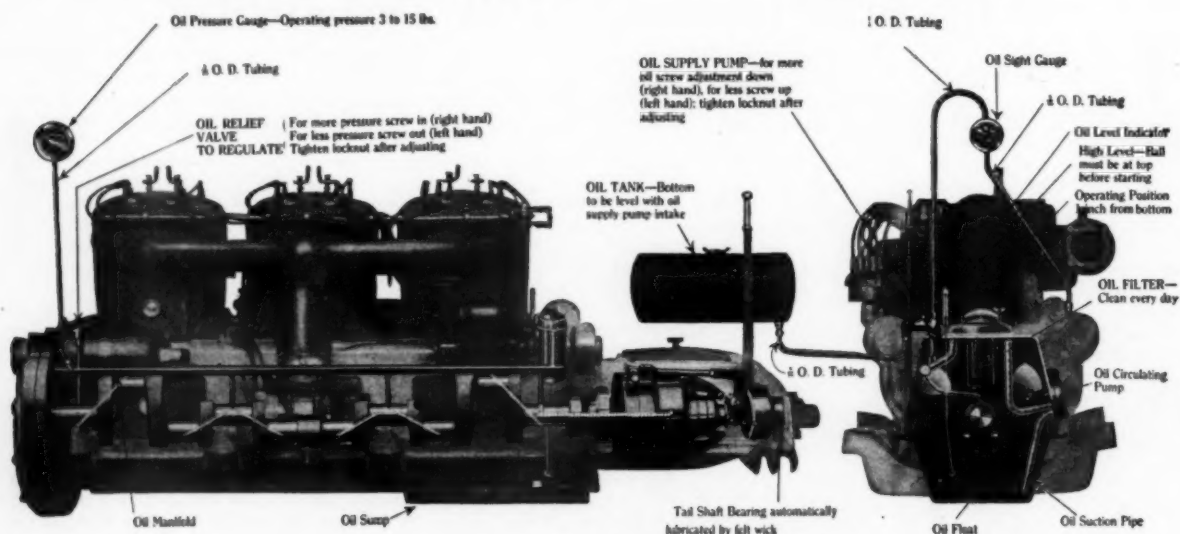
This operation should be repeated after the boat has been overboard for a day or two, as boats frequently change the shaft alignment somewhat shortly after they have been

launched. If the propeller shaft is long, there should be bearings at intervals of about 6 feet to prevent binding or whipping. With this detail properly attended to, the gasoline should be connected. It should be of liberal diameter, say one-half inch, and there should be a valve in the line which may be shut off when the boat is not in use. There should also be a gasoline strainer in this line, and it should be cleaned occasionally. Gasoline frequently contains water, and if the strainer is so situated as to be accessible, and has a small pocket at the bottom in which the water may drain, the deposit may be drawn off. The use of rubber hose in the intake line should be dispensed with, as rubber disintegrates from the action of gasoline and forms a sediment sufficient to choke apertures in the carbureter. The carbureter has been adjusted at the factory for the best speeds at which the engine is intended to operate in your boat, and it is best to leave it alone; but, if you feel that you *must* readjust it, it is wise to study the Wheeler & Schebler Instruction Book. About 50 percent of marine motor petty troubles are due largely to the fact that someone, unfamiliar, believes it his bounden duty to readjust the carbureter.

What is true of a carbureter, is also true of other accessories such as magnetos, starters, generators, etc. This electrical equipment is not particularly delicate. It is built to operate efficiently at a given speed and will stand a liberal amount of abuse, but the instruments do require a drop of oil occasionally,—and you can feed them too much oil. Here again it is advisable to study the instruction books which are furnished by the respective manufacturers of the instruments, and which accompany the motor.

It is well at intervals during the season to look after all moving parts of a motor, to tighten up cylinder bolts, etc. It is also advisable to clean spark plugs to avoid misfiring; and see that the spark gap is about 1/32-inch; to test the

(Continued on page 60)



OILING SYSTEM
Type F-5 x 61 Engines

LUBRICATING SYSTEM Force feed lubrication to main bearings connecting rods and reverse gear. Oil is pumped from sump thru filter, to manifold and forced into bearings. Relief valve on front end to be regulated for an operating pressure of from 3 to 15 pounds. After adjusting, tighten locknut on relief valve. Tail-shaft bearing is lubricated by a wick which receives oil from oil pocket in base.

OIL FILTER Clean every day or as often as possible.

OIL LEVEL INDICATOR Should show high level when engine is stopped. After engine is running ball will drop to about 1 inch from bottom, only enough oil in sump to circulate thru engine.

OIL SUPPLY TANK Locate on hull or bulkhead with bottom, level with oil supply pump intake. To regulate oil supply pump loosen locknut and turn screw down for more oil, and up for less; after adjusting tighten locknut.

OIL SIGHT FEED GAUGE Locate on hull or bulkhead, higher than engine gear housing. Have at least 1 foot drop to base connection.

BEFORE STARTING Put 6 quarts of oil in sump of 4 and 6 cylinder engines and 8 quarts in sump of 8 cylinder engines. 1 quart in reverse gear housing.

The maintenance of the oiling system of a marine engine in its proper condition is one of the most important points to keep in mind

Carl Fisher Offers Valuable Trophy for Displacement Boats

A Permanent Prize Worth \$5,000 as Well as an Annual Prize to the Winner Each Year to Stimulate the Building of High-Speed Runabouts—The Most Valuable Offer in the History of Motor Boating

AT last year's Gold Cup Races at Detroit, that popular and well-known sportsman and yachtsman, Carl G. Fisher of Indianapolis, watched and waited for several days for something to happen in the motor boat racing line to repay him for his trip to Detroit. Everything that did occur was of a negative nature—delays, breakdowns, mishaps, rough water, balky motors, boats catching fire, and all such incidents which contribute so much toward an unsuccessful hydroplane racing event. These were not unusual but to the contrary those who have followed speed boat racing for the last several years have grown hardened and accustomed to such casualties and have learned to expect them.

Mr. Fisher as well as most of the other spectators had become disgusted and the former called Commodore Judson, president of the American Power-Boat Association, and C. F. Chapman, editor of *MoToR BOATING* and secretary of the Racing Commission of the A. P. B. A. to him and offered to present a trophy worth \$5,000 to the Association for a race. The only requirement which Mr. Fisher specified was that the race must start at 3 o'clock on the days scheduled irrespective of weather, sea or any of the other factors and irrespective of spectators or owners' wishes. Mr. Fisher suggested to Mr. Chapman that he draw up a Deed of Gift governing such a class and submit same to him for his approval. This Mr. Chapman has done and Mr. Fisher has approved of the conditions for the series of races which should result in the development of a type of runabout in this country which will appeal to many sportsmen not heretofore interested in motor boat racing, as well as to those who were at one time boosters of hydroplane events but on account of the unreliability of these racing machines and the makeshifts adopted by some owners to win it at any cost have become disgusted with the whole sport and have promised themselves never again to become enthusiastic or allow themselves to throw their money away on a sport with such unsatisfactory results.

In addition to the trophy Mr. Fisher has agreed to donate to the winner each year a prize of the value of \$1,000, the winner to have the privilege of selecting his own prize. The American Power-Boat Association offers this trophy as a perpetual challenge trophy or until finally won under the rules decided upon.

This event is for displacement boats exclusively and the race will be for the Displacement Boat Championship of North America. It will be open to any club or association which is a member of the American Power-Boat Association, and any such organization will always have the right to challenge for the trophy and to run a match for it, providing, of course, that the challenge and match shall be run in accordance with the terms and conditions of the agreement. The matches must be run under the rules and regulations of the American Power-Boat Association governing sanctioned races, as adopted or amended at the annual meeting of the Association next preceding the race.

The first match for the trophy will take place on Lake George, N. Y., during the summer season of 1920, the

second match at Miami, Fla., during the winter of 1920-1921, and the third match at Detroit, Mich., during the summer of 1921. Subsequent matches are to be run at times and places to be selected later.

These races are to be open to displacement boats provided they are over 32 feet in length and have a piston displacement of the power plant of not more than 3,000 cubic inches. In order to enter for the event boats must be powered with a stock marine motor; this condition is to be very rigidly enforced. The hull may be either of the round or V-bottom type; the boats are to have a seating capacity of four persons; are to be equipped with electric starters, have stern exhaust and must be capable of a minimum speed of 40 m.p.h.

The maximum piston displacement of 3,000 cubic inches may be distributed in one, two or more units. Two eight-cylinder Speedways, Sterlings or even Van Blercks, or two of the new Murray & Tregurtha motors will meet the power plant specifications. If the maximum allowable piston displacement is used it will amount to something over 500 h.p.

Another unusual feature of the race upon which Mr. Fisher is insistent is that it will always start exactly at 3 P. M., irrespective of the readiness of contestants or their ability to get underway at that moment. He is determined that spectators shall be considered at this event as well as boat owners and with this in view owners of competing boats will have to begin to get their craft tuned

up far enough in advance to be sure they can start at the specified time. There are to be absolutely no postponements for any cause whatsoever.

The \$1,000 prize is to be permanent and to be retained by the winner but the \$5,000 Carl Fisher Trophy is to be a leg on trophy and to be retained only if the trophy be won three times by the same owner when it will become his perpetual property.

To insure a contest, one challenge must be delivered at least six months before the date set for the match. Subsequently, other clubs may challenge and enter the same contest on the terms proposed and accepted in the first challenge received; but no challenge will be received later than ten days before the date set for the first race of the match.

A match is to consist of three races to be sailed on consecutive days, excluding Sunday. The course is to be thirty statute miles in length and is to be laid in water not less than ten feet deep and is to be as free from turns as possible. The finish is to be at the starting line. The length of each lap of the course is to be three miles, and the course must be approved by the Racing Commission which is to have the power to accept it or reject it.

The start is to be a one-gun standing start with a preparatory gun five minutes before the starting gun. A flag is to be dropped one minute before the starting time and during the interval of time between the dropping of the flag and the starting gun boats are not to be permitted to make headway through the water toward the starting

(Continued on page 70)

Minimum Length of Hull.....	32 feet.
Maximum Piston Displacement of Power Plant.....	3,000 cubic inches.
Type of Power Plant.....	Stock Marine Motor.
Type of Hull.....	Round or V Displacement.
Length of Race.....	Three Heats of thirty miles each.
Date and Place of First Race.....	Lake George, N. Y., 1920.
Time of Start of each Race.....	3 P. M. (No postponements for any cause).
Seating Capacity of Boats.....	Four persons.
Exhaust.....	At Stern.
Starter.....	Electric.
Prize.....	Leg on Fisher \$5,000 Trophy and Permanent Prize valued at \$1,000 of Winner's own selection.
Race Management.....	American Power-Boat Association.
Minimum Speed of Competing Boats.....	40 M.P.H.

New Things for Motor Boatmen

Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descrip-

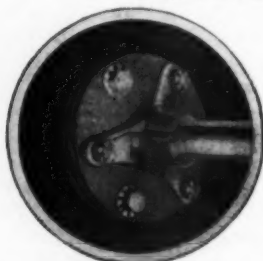
tions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.



Motor boatmen and yachtmen generally have long wanted a device that would scale the bottoms of their boats and take the barnacles off without the necessity of docking the craft. Here is a device that goes under the hull, yet can be operated from the deck



Running lights of an attractive design are these, operated electrically from your generator or storage battery system. This does away with the bother and inconvenience of keeping oil lights in condition



A new kind of universal joint. It transmits power without jolts and jars. All your power from your motor passes through the universal joint while being transmitted to the differential and rear axles. Heretofore, the universal joint has been made entirely of steel



Most people familiar with anchor rope have wished for something that could be done to reduce the weight of the hook without destroying its holding power. Here is an anchor claimed to withstand double the strain, pound for pound, of any other anchor

Fire-Guns the manufacturers call these devices that shoot a stream of liquid which vaporizes and blankets the fire instantly.

This is a hand extinguisher. It is double acting from the first stroke until it is empty and shoots a solid stream from 30 to 40 feet

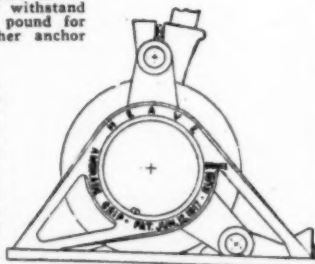


This flood light projector is particularly adapted for landing illumination, being designed for that purpose and not as a searchlight. The reflector is parabolic, but with modifications to get a wider divergence and with the lamp at a focus gives an even illumination

This is a storm-proof, rain-proof lantern that gives twenty times the light of an oil lantern. It makes its own gas from common gasoline, which is burned in a two-mantle burner. Mantles are hard and durable; if one is burned a good light is still obtained from the other.

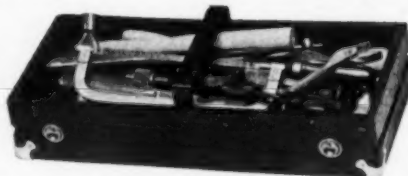


Made to handle three-eighths chain, this grip windlass embodies some wholly new features in windlass design. The frame is cut down to the absolute minimum of weight consistent with the necessary strength. It weighs only 47 pounds and takes up a deck space of 14 1/2 x 7 inches



Here is a first-aid kit that every boat should have. It contains a treatment for burns so simple that anyone can use it. It is applied as a liquid wax which seals the wound from the air and outside infection and brings immediate comfort from pain. It will eliminate scars

You may find it difficult to believe but this 20-inch tool chest will hold every tool that you may need under ordinary circumstances. Made in suitcase style it is ideal for carrying tools when you desire to take them to and from the boat. It is of oak, ebony stained



Do not fail to write to the editor if you desire information concerning any of the above new things

How the Diesel Engine Proves In

(Continued from May Issue)

PART VI

By Herbert Haas

COOLING WATER

FOR cooling the compressor and the engine a constant flow of water, adjusted to the engine requirements, is desirable. This is best supplied from a constant-head tank, which should be at least 20 feet above the water inlet to the engine, so that the head of water will overcome any vapor tension of the steam formed within the engine jackets.

In some engines the water is first passed through the after cooler and the intercooler and the water jackets of the compressor, then through the engine-cylinder jackets, and last through the head; in others independent water connections are used, with branches from the main supply pipe to the compressor and the different engine cylinders. Although the quantity of water required for cooling the engine is so much larger than that needed by the compressor that it is not warmed appreciably by passing through the latter first, an independent water supply to the compressor has much to recommend it, affording easier adjustment of the supply of cooling water to the different cylinders and heads. Separate discharges for the water from the cylinders and from the cylinder head should be provided, each with its own thermometer, so that the temperature in a cylinder or in the head can be controlled. The discharge pipes should be provided with valves, to regulate the discharge, as the water is under pressure.

In large installations, all the water-discharge pipes are brought to a central discharge point and mounted on a switchboard; a cock regulates the overflow, and a thermometer, mounted on the board above each respective discharge, indicates the temperature. A master valve controls the main supply to the engine. When the engine is to be shut down, only the master valve is closed, the other valves being left in adjustment.

Some care must be used in adjusting the supply of water to the engine needs, and an excess should be avoided, as it will cool the cylinders too much; they will contract, whereas the piston, being hot, will expand. Excessive cooling may thus cause piston seizures.

When the engine is stopped, the water should be continued in circulation for some time, as the heat stored in the piston, the cylinders, and the cylinder head is considerable, being sufficient to bring the water to the boiling point, so that sudden stopping of the circulation of the water might cause the cracking of a cylinder or of the cylinder head. If the water is hard, lime or magnesia salts may be deposited and interfere with the efficient cooling of the cylinder head and the cylinders, set up internal stresses, and lead to cracked heads and liners. When the water is hard, the best policy is to use distilled water, which should be cooled before use. The loss with an efficient cooling system need not be more than ten per cent. of the volume of water needed for cooling—amounting to one-fourth to one-half gallon of water per horsepower hour.

The volume of cooling water required varies with the size and type of the engine. Engines having a four-stroke cycle use from 2.7 to 4 gallons of cooling water a horsepower hour, the larger volume corresponding to smaller engines. Two-stroke engines use from 5 to 6 gallons a horsepower hour. The volume used depends on the initial and the terminal temperature of the water. The figures given are based on an initial temperature of 50 degrees F. and a discharge temperature of 160 degrees F. It is well to plan on not less than five gallons of water per horsepower hour for an engine having a four-stroke cycle, and not less than eight gallons for an engine having a two-stroke cycle. The capacity of the circulating pump should be 50 to 100 per cent. larger, depending on the type of pump used.

MECHANICAL EFFICIENCY

The air compressor, furnishing the injection air and usually driven direct from the engine, consumes considerable of the total power of the engine (7 to 15 per cent.) and this loss must also be deducted to ascertain the net effective output of the engine.

The mechanical efficiency of a Diesel engine is influenced by numerous factors, such as the type and the size of engine, the quality of the material and workmanship, the care given to details in erecting, the lubricating system, including the quantity and quality of lubricating oil used, the engine speed, and the volume of cooling water used. If too much cooling water is used, frictional resistance due to cylinder contraction may be greatly increased. It is always higher in new engines, until the different moving parts have worn the rubbing surfaces smooth.

As the internal power and friction of an engine are nearly constant regardless of load, the mechanical efficiency decreases with a decrease in the engine load.

The mechanical efficiency of engines having a two-stroke cycle is lower than that of engines having a four-stroke cycle, as, in addition to the power required by the injection air compressor, there is that required by the scavenging pump.

The mechanical efficiencies of four-stroke engines at full load vary from seventy-five to eighty-two per cent., eighty per cent. being usual for high-grade, low-speed engines of medium and large powers. The engine efficiency, exclusive of the air compressor, is eighty-five to ninety per cent. The mechanical efficiency of engines having a two-stroke cycle seldom exceeds seventy per cent. and may be as low as sixty-five per cent in high-speed engines.

THERMAL EFFICIENCIES

The thermal efficiency of a Diesel engine is the ratio between the equivalent in heat units of 1 h.p. and the number of heat units actually consumed by the engine in developing 1 h.p. If based on the indicated horsepower, it is the indicated thermal efficiency, E_{ti} ; if on the brake horsepower, it is effective thermal efficiency, E_{te} .

$$E_{ti} = \frac{550 \times 3600}{778} \times \frac{IHP}{WH} = 2545 \frac{IHP}{WH}$$

$$E_{te} = \frac{550 \times 3600}{778} \times \frac{BHP}{WH} = 2545 \frac{BHP}{WH}$$

In the foregoing expressions, 550 foot-pounds per second = 1 h.p.; 778 foot-pounds is the mechanical equivalent of 1 British thermal unit; W is the weight in pounds of the fuel consumed during 1 hour; H is the heating value of the fuel in British thermal units per pound.

If WH is the fuel consumption per horsepower-hour, expressed in British thermal units, then $E_t = \frac{2545}{WH}$

The thermal efficiency depends chiefly on the thermodynamic cycle of the Diesel engine, and is affected by the compression ratio (ratio between total cylinder volume and clearance volume at the end of compression) as well as the cut-off ratio (ratio between cylinder volume at time fuel valve closes and volume at inner dead center of piston or clearance volume).

The indicated thermal efficiency increases with a decrease in the cut-off ratio which contributes to the phe-

nominal economy of the Diesel engine at fractional loads, the fuel consumption per horsepower-hour remaining nearly constant between full and three-fourths load, and increasing only slightly at one-half load. The ignition of the fuel could be effected at lower pressures, but high compression is essential to high engine economy in Diesel engines.

The mechanical efficiency of the engine naturally influences its fuel economy (thermal efficiency) also, but to a minor degree.

The indicated thermal efficiency of the Diesel engine having a four-stroke cycle varies from 45 per cent. at full load to 47 per cent. at half load, and the effective thermal efficiency from 37 per cent. at full load to 30 per cent. at half load, which represents the best practice. As regards engines having a two-stroke cycle, the figures are 10 to 15 per cent. lower.

VOLUMETRIC EFFICIENCIES

The construction of the engine, its piston speed, its valve gear, and temperature are factors that influence the volumetric efficiency. To determine the volumetric efficiency of engines having a two-stroke cycle, it is not sufficient to know the pressure of the air that fills the cylinder (before compression begins); this value must be multiplied by the percentage of pure air present in the total weight of gas filling the cylinder.

For slow-speed four-stroke engines a volumetric efficiency of 90 per cent. can be reached, which decreases to 85 per cent. for high-speed engines, and for extreme speeds may be even lower. These values presuppose high-grade engines with mechanically operated valves.

At higher altitudes the specific duty of Diesel engines decreases appreciably, owing to the lessened density of the air, which affects the engine just as a low volumetric efficiency would. The horsepower rating of the engine decreases 3 per cent. for every 1,000 feet of added altitude. Nearly 40 per cent. of the power loss could be recovered by precompressing the rarefied air to atmospheric or slightly higher pressure in positive-pressure blowers and filling the engine cylinders with this air. Blower equipment is considerably cheaper per horsepower of capacity than Diesel engine equipment. At high altitudes it may pay, under certain conditions, to install blower equipment for precompressing the air for engines having a four-stroke cycle. An engine having a two-stroke cycle can compress the air readily by using a larger scavenging pump.

CHARACTERISTICS OF HIGH-SPEED ENGINES

Low-speed engines are preferred for hard, continuous duty. They have a piston speed varying from 600 to 800 feet per minute, increasing with the power. The number of revolutions per minute varies from 250 to 150, decreasing with the size of the engine. The stroke-bore ratio varies from 1.3 to 1.9, the higher ratio being preferred for low-speed engines for hard service, although with an increase in piston speed the stroke-bore ratio decreases; likewise the number of revolutions.

High-speed engines have a piston speed of 700 to 1,000 feet per minute, a stroke-bore ratio of 1.0 to 1.3, and an engine speed of 250 to 350 r.p.m. The speed of engines for special purposes, as for submarines, is often increased to 500 and 600 r.p.m. with low stroke-bore ratio to obtain a light engine of low height.

The mean effective pressure should not exceed 100 pounds per square inch at full load and is preferably kept around 90 pounds for hard, continuous service. The engines are designed to carry safely momentary overloads of 20 to 25 per cent., when the pressure will go as high as 120 and 125 pounds per square inch. Engines having a two-stroke cycle, in which the number of fuel combustions is generally double that in engines having a four-stroke cycle, are designed to operate with a lower mean effective pressure—between sixty-five and seventy pounds per square inch—with a margin for increasing the specific duty of the engine for short periods.

DESIRABLE PROPERTIES OF PETROLEUM FUEL

A desirable petroleum fuel for Diesel engines should have the following properties:

1. It should burn completely without leaving any residual matter in the cylinder, either in the form of soot, coke or ash.

2. It should be free from mechanical impurities which might clog the fuel pipes, the valves of the fuel pump, and the fine fuel passages in the fuel-injection valves and nozzles, or might cause excessive cylinder wear.

3. It should be sufficiently fluid at ordinary temperatures to flow readily to the fuel pump and thence to the fuel-injection valve.

4. It should be free from water, as water lowers the heating value of the oil may prevent its ignition.

5. It should be free from highly volatile oils, which will evaporate at ordinary temperatures and form an inflammable mixture with the air, thus introducing a fire hazard.

6. It should have a high heating value.

To determine the suitability of petroleum products as fuels for Diesel engines, they should be classified by tests as to the following properties, stated in the order of their importance:

- 1, boiling-point range; 2, ash content; 3, mechanical impurities; 4, heating value; 5, water; 6, coke; 7, asphalt; 8, paraffin, and 9, sulphur content. 10, acidity; 11, elementary composition; 12, viscosity; 13, flash point; 14, burning point, and 15, specific gravity.

The distillation is conducted at atmospheric pressure between the following temperature ranges: 0 to 150 deg. C.; 150 to 200 deg. C.; 200 to 250 deg. C.; 250 to 300 deg. C.; 300 to 350 deg. C., and 350 to 400 deg. C.

As a general rule the smaller the proportion of residue remaining at a temperature higher than 400 deg. C., and the greater the volume of vapor coming over between 200 and 400 deg. C., the better is the oil suited for use in Diesel engines. A further valuable criterion of the burning qualities of oils that leave residues or "oil tars" at temperatures higher than 400 deg. C. is the quantity of coke left on distilling the residue at temperatures higher than 400 deg. C. The greater the quantity of coke the less suitable is the fuel. Fuel oils with a coke content cannot be used in all engines, and a content of 5 per cent. may be taken as the upper limit for all engines.

It has been noted that some crude oils having a high proportion of constituents that produce coke and asphalt and yielding an unusually large proportion of residues at temperatures higher than 400 deg. C. decompose (crack) at temperatures between 300 and 400 deg. C. This feature is particularly noticeable in certain California oils and Mexican oils. Such an oil is unsatisfactory for Diesel engines, as only a comparatively small part of the oil is readily burned, a large part being changed to coke; the coke particles contaminate the film of lubricating oil, fill the space between the piston rings and cover the piston, making lubrication ineffectual, causing increased cylinder wear, and requiring frequent cleaning of the engine.

LUBRICATING OILS

Two kinds of oils are used for the lubrication of Diesel engines—bearing oil and cylinder oil.

BEARING OIL

Bearing oil is used for the lubrication of the main, the crank-pin and the piston-pin bearings, and of the camshaft bearings, and for the oil baths into which the cams and the camshaft dip. A pure mineral oil will fill these requirements if it has a maximum viscosity of 7 deg. Engler at 50 deg. C., if it does not congeal at a temperature higher than -10 deg. C., and if it has a flash point of 180 deg. to 200 deg. C. The oil should be entirely soluble in benzene, forming a clear solution without any residue; also, it should be entirely free from acids, resinous substances, and vegetable matter.

(To be continued)

Decks Cleared for Action

MoToR BoatinG Completes Complement and Is Ready for a Record Cruise
Adds Two to the Advertising Staff and One to Look After News

By the Cabin, er, er, Office Boy

IT is with a feeling of extreme trepidation and we trust with due modesty that MoToR BOATING presumes to take a little toot on its own horn in this issue. Not being equipped with an automatic horn connected with the exhaust from our motive power we do not expect that the welkin will resound with our echoes, but as some of our readers are a bit hazy as to who is who in the crew of MoToR BOATING since the war ended it is the part of good seamanship to toot one's horn and incidentally wet one's whistle if the haze is thick enough to prevent others from seeing you very clearly.

When the armistice was signed MoToR BOATING believed it was an excellent time to ship some new members for its crew as it had lost a number of its personnel during the war.

Skipper Charles F. Chapman who, it might be noted in passing, is a man of impressive mien, was in pressing need of an executive officer, and being impressed by the work that former Ensign Harwood Koppel was doing for the New York Evening Post, the Times, the American, the Brooklyn Eagle, and other publications, he impressed Mr. Koppel into the crew of

signed to cover New York and the New England States for the Advertising Department, for after all, it is from this source that all magazines derive their motive power. Mr. McKean was particularly well suited for this work, as before the war he had been connected with the Williams Publishing Company, publishers of trade periodicals, and had made a record as a business getter with that firm.

The deck and the starboard watch had now been provided for, but another man was needed in the black gang of the port watch and so Skipper Chapman took a little skip to the windward, landed in the Windy City and dropped his grappling hooks on Naval Reservist Charles P. Monahan, who had been recommended for a commission just before the armistice was signed. Mr. Monahan, of the U. S. N., had been a member of the advertising staff of the Chicago Tribune prior to his enlistment in the Naval Reserve and immediately after his release and preceding his being dragged aboard of MoToR BOATING.

MoToR BOATING is now running along more smoothly and making better seaway since her complement has been completed by this trio of expert seamen and motor



Three new members of the crew of MoToR BOATING. All served in the Navy and one in the Army and French Service as well, while another of the crew is still abroad, an officer of the Navy

(Above) Robert Clayton McKean, who covers the New York and New England advertising field, started as a Chief Boatswain's Mate and won promotion to a Junior Lieutenantcy



The Navy, Army, and French Military Service all claimed Harwood Koppel, Associate Editor. He started as an Ensign and ended with a recommendation for an Army captaincy



Only the ending of the war prevented Charles P. Monahan, who covers the Western advertising field, from securing the commission of Ensign, for which he had been approved

MoToR BOATING as Associate Editor, immediately the Government consented to release him from its service.

But it was not only the deck force that was short handed but the black gang needed help. Hence Lieutenant (j. g.) Robert Clayton McKean, who had graduated from Stevens Institute and Columbia University as a mechanical engineer, was shanghaied for the motive power force, and as-

boat enthusiasts, in fact, she is making so much speed that she is double the distance in circulation of her nearest competitor, and gaining momentum every month. With her full crew on deck she has been put in better shape than ever.

The new Associate Editor, who has now been with MoToR BOATING almost four months, is a native of New

(Continued on page 64)

Take the Tax Off Motor Boats

Reasons Why the Present Exorbitant and Discriminating Levies on Motor Boats and Yachts Should Be Removed by the Present Congress
Every Motor Boatman Advised to Get Busy at Once and Bring All Possible Pressure to Bear on His Senators and Representatives

By Charles F. Chapman

CONGRESS is in session. The unfair and discriminating tax on the use of motor boats must be taken off. There is just one way by which this can be done. This way is—for every motor boatman, every yachtsman, and every yacht club in the country to protest against the existing state of affairs; to bring every bit of possible pressure to bear on their representatives and senators in Congress at Washington; to have every yacht club pass resolutions condemning the present tax and urge a repeal of the law; to have petitions signed by every motor boatman and forwarded to Congress from their own home districts.

Mention of a little incident showing why the present tax was placed on motor boats by that hostile Sixty-fifth Congress which went out of existence a few months ago may prove of interest to the motor boatman and emphasize to him the need of concerted action at this time if satisfaction and justice is to be hoped for. The writer during his visit at Washington last winter at the time MoToR BoAt-ING made such a successful effort to have the tax on small motor boats reduced from the exorbitant rate of \$1 per foot per year down to a rate of \$10 per year on all motor boats of less than 5 net tons, was in the office of Senator Penrose of Pennsylvania urging his support of the effort to have the motor boat tax reduced. Senator Penrose remarked that he would like to relate how it happened that motor boats were to be taxed at a rate out of all proportion considering the existing conditions. He remarked that when the little group of the Powers That Be were assembled together talking over the tax situation and discussing just what industries, sports, etc., should be taxed, the question of a tax on motor boats came up. The representative from North Carolina, well known as the Whip in the last House of Representatives, spoke up saying, "Motor boats, motor

A Few of the Reasons Why the Existing Tax on Motor Boats Should be Removed by Congress

1—The existing tax of \$1 per year per foot of length for boats under 50 feet in length; \$2 per year per foot of length for boats between 50 and 100 feet in length; \$4 per year per foot of length on boats of over 100 feet in length, and \$10 per year on boats of less than 5 net tons is excessive in comparison with the tax imposed upon any other commodity or sport.

2—There is no Federal tax on automobiles, motor cycles, or any of the automotive vehicles except motor boats.

3—There is an additional war tax of 10 per cent. of the first cost on all new motor boats and yachts.

4—A great majority of boat owners must keep their boats at yacht clubs. They are required to pay a 10 per cent. war tax on their yacht club dues, which really amounts to a tax on the moneys expended for the maintenance of one's boat.

5—Owing to the shortness of the boating season, and the fact that the majority of boats are used only during week-ends, the tax on the use of boats generally amounts to several dollars a trip. Motor boats on the average are not used more than ten times a season, therefore, one taxed \$75 per year pays \$7.50 tax each time he uses his boat.

6—The present basis of taxing boats on net tonnage or overall length is unfair. Some yachts worth \$50,000 are taxed only \$10 per year, while others worth only \$1,000 are taxed from \$30 to \$100 per year.

7—The annual tax on automobiles is a state tax, and in no case a war or Federal assessment. The several states and cities expend annually sums greatly in excess of the moneys received from automobile owners for the direct benefit of these tax payers. The money paid by the car owners is spent for new roads, traffic expenses, lighting, signs, street maintenance, etc., etc. The motor boat or its owner costs the state or national Government nothing. Not a cent is expended by the Government for the direct benefit of the motor boatman.

8—In many cities and localities motor boats and yachts are taxed by the local government.

9—As the present unfair and exorbitant tax is on the use of motor boats, many owners are keeping their craft out of commission, thereby making them untaxable. The net income to the Government is therefore probably much less than if the tax was reasonable, and permitted all owners to put their boats into commission.

10—Thousands and thousands of small motor boats are discriminated against, inasmuch as there is no tax on small sail boats and similar craft, which are decidedly more of a luxury than the motor boat.

11—The average motor boat is owned by a man of small or moderate means. He generally uses his motor boat as the only form of recreation for himself and his family.

12—Many motor boat owners use their boats almost exclusively for fishing purposes and a partial means of livelihood.

13—No body of sportsmen were more patriotic during the war than the motor boatmen and yachtsmen. They gave their own service and gave or loaned their boats to the Government. The personnel of the Naval Reserve Force was over 50 per cent. ex-yachtsmen. They turned over their yacht clubs to the Government. They gave instruction in all branches of nautical service, and were directly responsible for the enlistment of thousands of trained young men in the Navy.

boats, let me see—Oh, yes, yachts, full of champagne and women, soak 'em." And soak them they did.

In an intelligent effort to have the tax taken off we must emphasize facts and point out to our Senators and Representatives that motor boats are not yachts and furthermore they are not loaded down with the cargo as expressed by the representative from North Carolina. Most Congressmen know little or nothing about motor boats or boating. If the right kind of an effort is made to reach them and acquaint them with a true statement of conditions there should be no difficulty in securing their support for a repeal of that part of the existing war tax law which imposes such an unfair tax upon the craft of our favorite sport and pastime.

Now is the time for you to act—not a day should be lost. Congress has many other important matters which requires its attention, so unless something is started at once by the yachtsmen they cannot hope for success.

In your petitions and when taking up with your Congressmen the subject of having the tax on motor boats removed give them true statements of the facts so that they may appreciate and realize that you are thoroughly familiar with the situation and know what you are talking about.

On this page are enumerated some of the reasons why the present tax on the use of motor boats should be eliminated. There are, no doubt, many others which you will think of which are applicable to special cases for particular localities. Make use of all of these in your arguments, varying them in a way which you believe will give them the greatest force. We also give below a list of the Senators and Representatives of the Sixty-Sixth Congress which is now in session. From this list by knowing their home addresses you can determine which of the Congressmen represent you and are bound

(Continued on page 62)

Old Firm Changes Name

Gas Engine & Power Co. and Charles L. Seabury & Co., Cons., now Consolidated Shipbuilding Corporation, Officers and Location Unchanged

OWING to the cumbersomeness of its names, the Gas Engine & Power Company and Charles L. Seabury & Company, Consolidated, has decided upon a name not only briefer but better suited to its present and contemplated lines of industry and hereafter will be known as the Consolidated Shipbuilding Corporation. In 1885, when the original company was formed to build naphtha launches, and a gas engine lighting outfit the name Gas Engine & Power Company seemed quite suitable and when in 1896 the Seabury company joined the other company both names were retained as it was felt that both had a trade value. Various incidents that have occurred since have proven to the officials of the company the necessity of shortening the title. The name of Speedway which the company has used extensively in its advertising and in naming various of its products will be retained and used as formerly.

President John J. Amory, Vice-president William J. Parslow, Secretary and General Manager Bruce Scrimgeour, and Treasurer Clement G. Amory who have been in the industry many years have not changed their positions.

The Gas Engine & Power Company was first established at Brook Ave., and 131st St., New York City, and two years later, owing to increased business moved to Morris Dock, now known as Morris Heights and the present location of the shipyard. This company was founded by F. W. Ofeldt the inventor of the naphtha engine which the company manufactured and by Clement Gould. Charles L. Seabury was superintendent of the original company and William Parslow office manager. At that time the naphtha launches were the only power-driven launches other than steam and proved an instantaneous success. It was in the fall of 1887 when Mr. Seabury had been elected vice-president that John J. Amory joined the firm as secretary and treasurer.

Two years later Messrs. Seabury and Parslow left the company and established a yacht building company at Nyack on the Hudson, this being the original Charles L. Seabury Company. It was a pioneer builder of steam yachts, steam engines, and water tube boilers and delivered some of the finest and fastest pleasure yachts of that period. The other company was busy turning out its naphtha launches, at that time the only power launches made. Clement Gould died in 1894 and John J. Amory succeeded him as president. In that year the company began building electric launches for the company that is now the Elco Co., of Bayonne. This company occupied space in the Morris Heights yards and the two companies worked in conjunction producing electric launches for six years.

When the Seabury company was purchased in 1896 its plant was moved to Morris Heights making it necessary to purchase additional property and equipment. Mr. Seabury was elected first vice-president and a few years later Mr. Parslow was made third vice-president.

In 1897, it undertook a contract to design, construct, and power one of the first class of torpedo boat destroyers for the United States Navy, Bailey. This boat won world-wide renown, holding for several years the distinction of being the fastest boat in the Navy. Two other torpedo boats were built a little later, known as Stewart and Wilkes.

Subsequently, the company took an active part in Government work, building many steam launches, life boats, engines and boilers. In 1904, it built the gun boats Dubuque and Paducah.

During these years, while the popularity of the naphtha launches continued, the gasoline engines introduced in automobiles began to find its adaption for marine use. In 1903, the company first took up the building of a gasoline marine engine, which was known as the Speedway and which has had such a remarkable success in this field. The power found available in the gasoline engine soon caused the call for speed on the water. John J. Amory and Charles L. Seabury were foremost in the building of the first speed boats, which John J. Amory termed auto boats. This class of boat was immediately popular and continued so for

many years. The name gradually died out and has given way to the more common term of motor boat.

Some of the company's first well-known speed boats were:

Japansky for E. J. Schroeder; Argo for W. Child Drexel; Skeeter for Robert J. Collier; Whistler for Carl G. Fisher; Tartar for Ralph H. Slaven.

Before the consolidation the Seabury company had made a reputation for fast steam yachts. At Morris Heights many of this class of craft were built. Among the best known are Kanawha, famous winner of the Lysistrata cup; Sovereigns, for M. C. D. Borden, well known for their fast trips from Sandy Hook to New York; Vitesse, for Brayton Ives; Vixen for John D. Archbald; Niagara IV for Howard Gould; Levanter for Alfred Marshall; Lydonia for Cyrus H. K. Curtis; Machigonne, for W. L. Douglass; Aria for Edward H. Blake; Galatea for E. L. Ford, Halcyon for F. J. Hecker, and Helenita for Frank J. Gould.

Gasoline engines were soon designed in larger units suitable for driving yachts. As a consequence this type of boat came in demand. Some of the most prominent of those boats built by this company are Thelma for Morton F. Plant; Jane for R. Waverly Smith; Corinthia for J. Adolph Mollenhauer; Blue Bird for Clarke Poole; Natoma for Charles Foster; Whirlwind for Julius Fleischmann; Raven for Carl G. Fisher; Zumbrota for Charles Ringling; Siwash for Charles Schieren, and Miramar for Charles Eisenlohr.

The company during its first building of gasoline engines, entered the automobile field and built a Speedway car. This met with some success and reached the point where it promised to engage the entire facilities of the shops. It was decided to retain the property as a boat and yacht building establishment, so the building of automobiles was abandoned.

In 1914, Charles L. Seabury resigned as an officer of the company, and a few years later left the organization.

The outbreak of the war found the company following its usual line of business. It immediately offered its entire resources to the United States Navy. The company was first called to convert the various pleasure yachts and motor boats for service for both overseas and local waters. Some of the prominent boats changed over were the Kanawha, John Borden; Gem, William Ziegler; Chichota, Edwin Gould; Helenita, Frank J. Gould; Vixen, John D. Archbald; Sachem, M. B. Metcalf; Tarantula, W. K. Vanderbilt, Jr.; Privateer, R. A. C. Smith; Marie, G. M. Pynchon; Sabalo, Earl W. Dodge; Whirlwind, Julius Fleischmann; Dodger II, H. I. Pratt; Anado, J. A. Mollenhauer.

The company was then called upon to build five 1,000-ton steel ocean-going mine sweepers. This task was a large one and necessitated the addition of heavy tools and machinery and the installation of an entire new steel ship construction equipment.

The next contract was one which engaged the small-boat building department for 175 flying-boat hulls. Contracts for nine tugs were also taken from the Shipping Board of the Emergency Fleet Corporation.

When the armistice was signed the company had fortunately delivered three of the steel vessels, seventy-five flying-boat hulls and had converted for service in the Sectional Patrol of the United States Navy, some seventy-five yachts and motor boats, besides completing considerable repair work on Navy vessels.

The Consolidated Shipbuilding Corporation is now busily resuming its former line of business.

The manufacturing organization is headed by men who have been connected with this company for many years. It is headed by Bruce Scrimgeour, General Manager; Joseph S. Cotter, Superintendent; Albert Christen, Mechanical Superintendent; H. W. Patterson, Chief Constructor; H. E. Fromme, Chief Engineer; J. E. Lowery, Head Boat Builder; and J. M. Forhenbach, Assistant Superintendent.

Comfortable 49-Foot Cruiser

The Burger Boat Co., of Manitowoc, Wis., has produced an exceedingly well arranged, comfortable cruiser of 49 feet 3 inches over all, free of all frills and fancy work and a boat that should prove a good investment. This craft has a beam of 10 feet 4 inches, and a draft of 3 feet 9 inches, clean lines, a sensible cabin plan and is a harmonious whole. She is to be constructed with a round bottom which will slip along easily at 15 m.p.h., according to her builders, when equipped with only a 60 h.p. motor and more speed may be produced by increased power. Extreme speed can be secured with a V-bottom hull when it is estimated 25 m.p.h. will not be unusual.

In the cabin arrangements there are accommodations for guests in three separate units with a toilet for each and all engineer's stores and supplies can be taken directly into the engine-room, and the coal, ice, and galley stores directly into the galley. There is an extra berth in the engine-room. The arrangements are designed to take care of a party on a cruise with plenty of wardrobe room.

Thousands of Experiments to Produce a Finished Product

Some idea of the amount of work which large corporations must undertake before products which meet their approval are placed on the market may be obtained from the

statement by F. B. Caswell, sales manager of the Champion Spark Plug Co., of Toledo, O., that the name of Champion 3450 Insulator was derived from the fact that this particular insulator was the result of the 3450 experiment. Its superior qualities demanded that a special name be given it and hence its name. At the insulator plant of the Champion company, a laboratory is maintained, said to be the most complete of its kind in the world. The chemists there are experimenting constantly with the ingredients used in the manufacture of porcelain spark plug insulators.

"A spark plug's reputation," said Mr. Caswell, "depends largely upon the quality of its insulator or porcelain. Other parts made from steel, brass, copper, and asbestos must be rigidly inspected before the final assembly, but the insulator requires an expert's attention from the time the raw materials are mixed together until they come forth as the finished product. The three distinct advantages of our new insulator are that it offers three times the resistance to breakage due to sudden changes in temperature; two and one-half times the resistance to breakage due to shock and vibration and half again as much resistance to electric current when heated."

Delaware Correction

The Delaware Marine Motor Co., of Wilmington, Del., write to advise that through an error in the proof copy of its catalog from which a description of the Delaware motor was written in the May issue of MoToR BOATING it was stated that the flywheel is keyed on the shaft, when as a matter of fact this feature has been changed and the flywheel is fastened to the crankshaft with a flange and bolts.

Yard and Shop

Notes of Interest to Both
Owner and Manufacturer

Alaska Approves Anderson Motors

From far off Alaska the Anderson Engine Co. has received a letter testifying to the merits of its engines. Said the writer:

"I have one of your single-cylinder 4 h.p. engines and have run same on the Yukon and Innoka Rivers and their tributaries for four years and have never had it in the repair shop. I made many trips far away from any habitation, and the old one lugger always brought me back. Never had a tow, but towed a few myself. One a 65-foot gas scow. It was slow work, but we got there."

Albany Holds Own Show

The Albany Boat Corporation held an exhibition of new cruisers, runabouts, and accessories from May 10 to 19 at Watervliet, N. Y., at which visitors were offered an unusual opportunity to become acquainted with the principles of construction applied in Albany standardized boats. The latest cruisers and fast runabouts, expressive of comfort and refinement, as well as several new engines and boat equipments, were shown.

The shops were open to the visitors and each successive stage of Albany construction from laying the keel to the final coat of varnish was shown. New boats were demonstrated in action on the Hudson and President L. L. Tripp made it a point to personally see to the convenience and comfort of the firm's guests, showing them around himself.

Superior Makes Superior Motors

The Superior Motor Works, manufacturers of gasoline and oil stationary and marine motors, of Jackson, Mich., is calling attention to the fact that its motors possess several points which make them different from the usual two-cycle motor. They are of the 2-port type but their intake valve is mechanically operated by means of a conventional arrangement of camshaft and gears: it

is claimed for this positive valve action, that it permits of much greater volume of mixture being drawn into the crankcase with consequent gain in power, and that it allows of a nicety of throttle control for all speeds equal to that of four-cycle engines, with consequent gain in economy. Rings are turned integral with crankshaft which run in corresponding grooves in the main bearings which effectively prevent crankcase leakage. All wearing parts are of extra large size, which, without making the motors unduly heavy, insures the maximum of durability.

Belgian Royal Yacht Club Wants to Buy American Motor Boats

"Landerbrugge, March 19, 1919.

"Editor of MoToR BOATING,

"New York, N. Y.

"Dear Sir:

"Since yesterday our Post Office has reorganized the money order service with United States. I have sent you a money order for \$3 which I hope you will safely receive.

"I am anxious to receive again my subscription to our cheerful MoToR BOATING, a magazine of the highest in-



Carmelita, pictured here towing another boat almost as large as herself, plies between Mexican ports on the Gulf. She was sold by the General Export & Commission Co., of New York. She is powered with a 40-45 h.p. heavy-duty Buffalo engine and is giving excellent service in all weathers.

terest for boat enthusiastic people. We enjoy again the liberty of corresponding with the civilized world from which the Germans have cut us off during four interminable years! The Germans behaved in our poor Belgium, not as human and loyal enemies should do but as brutal beasts. What they left undestroyed is not worth to be mentioned. Our yacht club has not a single boat left. Even our garage they have plundered and destroyed by dynamite. Everything must be re-edificated. It will take months, years to get as it was pre-war. Oh, what hateful people those German brutes! You could not realize enough in your gracious country that what the United States did for Belgium fills our hearts with imperishable thankfulness. Our club would greatly appreciate some of your boat builders in K. D. form to send us their catalogs with best prices. No one of us would ever buy any goods in Germany. We will cheerfully and gladly place our orders in your knightly and blessed states—I wish I lived there.

"Most sincerely and highly devoted,

"Sd. GROVERMAN,

"Pres. of Royal Yacht Club,

"Landerbrugge, Belgium.

"Please excuse my language. I had no more opportunity to use English so long since."

A New Reverse Gear for Motor Boats

In answer to a recent but rapidly growing demand for a gear expressly designed for heavy-duty work boats, the Snow & Petrelli Mfg. Co., of New Haven, Conn., has designed and is marketing a new reverse gear or transmission known as 'Joe's Husky,' Mr. Snow, the founder of the firm, and a man closely identified with the design and manufacture of reverse gears since 1906 explains the salient points of the new gear, saying:

"In designing 'Joe's Husky,' however, our engineers have not only incorporated the strong points developed in years of experience, but have conformed every part to the best obtainable engineering data. The Internal Gear is recognized as the strongest and most durable of all transmission gears, and 'Joe's Husky' is unique in having a double Internal Gear drive, that is, an internal gear is driven by the motor, and another internal gear drives the propeller. The connecting pinions are made especially large and strong, which permits the use of unusually large bearings. These bearings are made hollow and serve also as reservoirs for the reception and distribution of oil. This is a new and exceedingly important feature, for the life of a reverse gear depends more on proper and sufficient lubrication than on any other one feature.

"The main shaft of the 'Husky' runs straight through the device which prevents any tendency to buckle and cause undue pressure on the parts, due to cramping. Another very important feature is the reverse speed ratio which is slightly over 85 per cent. and is sufficient to get quick and efficient action where needed. There are several other strong and novel features, such as a combined cone and disc clutch which takes the entire forward driving strain from the gear teeth, and prevents all back lash and looseness, and then instead of a brake band which exerts a strong side thrust when reversing, a brake is used which entirely eliminates the side thrust. This arrangement also insures a free neutral and strong drive in either direction. And, last but not least, 'Joe's Husky' is designed so that it can be set onto the bed and coupled to the motor and propeller shafts without moving it endwise and by the same token it can be uncoupled and lifted out without disturbing the motor or hauling out the boat. While no untried or freak construction has been made use of, many decidedly new adaptations of well tried out principles have been adopted.

Talbot Corporation Enlarges

The Talbot Engineering Corp., of 66 Broadway, New York City, has bought the entire plant at Plattsburgh, N. Y., that was formerly occupied by the Lozier Automobile Company. The plant occupies a tract of land of about twenty acres, and has a very complete and up-to-date set of buildings on the property. There are six buildings in all, with a total of about 170,000 square feet of ground floor space.

The company, which manufactures boilers, engines, pumps, and steam specialties, and has up to the present occupied part of the above plant, has found it necessary to acquire the whole plant to take care of its rapidly increasing business.

Columbian Moves Showrooms

The Columbian Bronze Corp. announces the removal of its New York City showrooms from Concourse 50 Church St., to the more central location of 44 Third Ave., between Ninth and Tenth Sts., one block east of Wanamaker's.

In this firm's advertisement in the May issue it appeared that the executive offices had been changed to the new address, whereas they remain as formerly in the Hudson Terminal Bldg., 50 Church St., only the local showrooms being removed.

The Buffalo Book

One of the handsomest brochures that has been issued in some time is being sent out by the Buffalo Gasoline Motor Co., of Buffalo, N. Y., to describe and illustrate its line of marine engines. The title, *The Buffalo Book* is embossed on a brass name plate and attached to the heavy board cover. The pages of the brochure are of heavy enameled paper and the typing and illustrating are unusually attractive and well balanced. There are many sectional blue and black prints of the engines. The Buffalo Book may be had by anyone interested in motors merely for the asking.

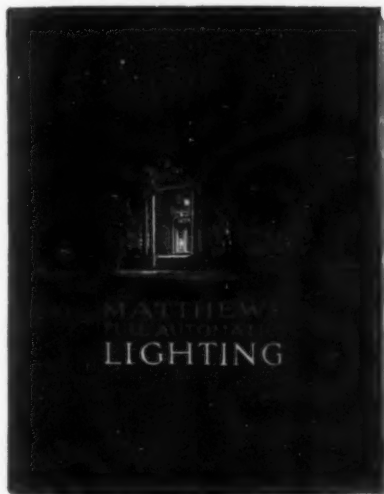
Deering Heads Resume Work

After a year's service abroad August Deering, designer of the well-known Deering hydroplane for outboard and inboard motors, and head of the Deering Boat Mfg. Co., of Madison, Wis., Wm. S. Maple, head of the production department and W. E. Patton, secretary and assistant sales manager are again on the job.

The new models of the company this year are among the finest made for outboard and inboard motors. The Air-drive and Deering Hydro-Special boat is one of the best on the market for Airdrive and Aerothrust motors. The firm is endeavoring to build up a stock to take care of this summer's business but orders are piling up almost as fast as the boats can be turned out.

Motor Boat His Reward for Patriotic Service

T. Howard Stewart, of Montreal, Can., conceived a novel method of rewarding his son for three years of service in a Canadian regiment in France by having constructed for the young man while he is still abroad a fast 30-foot runabout in the shops of the Pyke Motor & Yacht Co., of Montreal. Mr. Stewart stipulated that the boat must be of express speed without sacrificing any comforts and that all furnishing and equipment must be of the very best. John L. Hacker, the well-known Detroit naval architect, designed a boat, which is a development of his sensational Hoosier IV, winner of the Southern Displacement Championship Races at Miami, Fla., and holder of the



Handsome cover design of the new catalog of lighting plants, in all sizes from 15 lamp to 500 lamp capacity, just issued by the Matthews Engineering Co., of Sandusky, O., which will be sent upon request

The power plant is a six-cylinder, Model F, 130-145 h.p., Sterling motor, an exact duplicate of the plant of Hoosier.

Frank R. Farnham, formerly sales and advertising counsel of Hollister, White & Co., and their allied interests, has joined the organization of Rex W. Wadman, Inc., Technical Advertising, as vice-president.

To Resume New York-Albany Race

A racing program which will provide an active season is also being formulated. The Rockland Light, Tarrytown Light, and other popular races will all be revived. It now remains with the yachtsmen whether the efforts of the committee will be a success.

Prescott Joins Remy

Mr. Prescott, was a designing engineer in the automobile equipment section of the Westinghouse Electric & Mfg. Company, with which he had been connected about two years, when he was called to the service, in December, 1917, as Second Lieutenant, Engineering Reserve Corps. He was on duty with the production division of the General Engineer Depot throughout the war, being promoted to First Lieutenant of Engineers in August, 1918. Most of his work was in connection with the production and inspection of 60-inch and 36-inch searchlights used by the mobile army and the coast artillery corps.

Lunkenheimer In New Quarters

Kemp Issues Brochure

describing its airdrive motors for canoes, rowboats and shallow draft commercial boats. The brochure contains illustrations of various boats equipped with the Kemp air-drive motors, explains the advantages of this type of propulsion and gives specifications with a sectional diagram of the motor transmission.

The Navy Department advises that further sales of motor boats which were taken over for war purposes will be offered for sale June 5. These are all well-known boats powered with engines of standard make. They are:

The sales will be for cash to the bidders offering the highest price and sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, until 12 o'clock noon, June 5, and then will be publicly opened. Full information and specifications of the boats may be obtained by addressing the Bureau.

During 1919-20 Brown University will offer the following courses:
Navigation.

Compass and chart; piloting; plane sailing, middle latitude sailing, Mercator sailing; dead reckoning; the sextant; determination of latitude by the sun, moon, planets, and stars; azimuth; line of position by the methods of Sumner, St. Hilaire, and Aquino; great circle sailing; theory and practice of compass adjustment. Professors Slocum and Brown.

Rules of the road; aids to navigation; hull, fittings, and rig of various types of ships; ground tackle; propellers; steering gear and steering; blocks, tackle, and purchases; handling and maneuvering; boats and boat equipment; stowage of cargo; duties of crew and of-

Ship's Business.

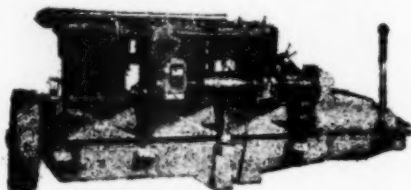
Tonnage; ship's papers; shipping articles; charter party; bill of lading; manifest; clearance and entrance; pilotage; the log book; trade routes; ports and terminals; rates; subsidies; marine insurance; rules and regulations pertaining to ships, crew, and cargo. Professor Brown.

History and development of the American Merchant Marine from its beginning down to the present. Professor Slocum.

Advanced course in Navigation.

Problems in navigation, compass adjustment, and chart work. Professor Slocum.

A three-hour semester course in Sea Power in War and Peace will be offered by the Department of Social and Political Science.

**เกรียง ชนกันต์**

ตำหรับเรือ

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מחירי זהב וזהב צהוב 24 קראט 100 גרם 1000 ש"ח

ก็โรซิน (นำนิกเกิล) เป็นเครื่องที่ ใช้ไม่ เปิดองใส่หุ้ย

Even the Siamese appreciate Scripps มริษัท นา ไช้ แมวส์ ค. จ. ก. เปน เซเวนส์

motors. If you doubt it, read this extract from the *Bangkok*

this extract from the Bangkok Times yourself. We would tell

Times says, but know you would prefer reading it for yourself



VALENTINE'S VALSPAR

The Varnish That Won't Turn White



THE *Zumbrota* was built by Charles L. Seabury & Company for Mr. Charles Ringling, of circus fame. She spends most of her time in Florida waters—and, like most good boats there and elsewhere, she is Valsparred, of course.

Boat owners say that Valspar is the only varnish which stands up under the peculiar climatic conditions of the Florida coast.

In the daytime the sun's rays are intensely hot. At night the air is chilly and a heavy dew falls. The result is fatal to ordinary varnish—but it never harms Valspar.

As a matter of fact, Valspar is proof against all conditions of weather, season and climate. It does not crack or blister, and it won't turn white.

Booklet on request.

VALENTINE & COMPANY
456 Fourth Avenue, New York City

ESTABLISHED 1832 — Largest Manufacturers of
High-grade Varnishes in the World

New York	Chicago	Boston	London	Toronto	Amsterdam
TRADE MARK			VALENTINE'S		
W. P. FULLER & CO., Agents for the Pacific Coast:					
San Francisco	Los Angeles	Sacramento	Oakland	Stockton	San Diego
Portland	Seattle	Pasadena	Long Beach	Santa Monica	Boise
		Tacoma	Spokane		

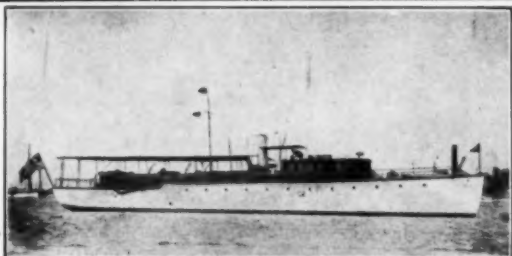
Photo M. Rosenthal, N.Y.

Naval Architects
and
Yacht Brokers

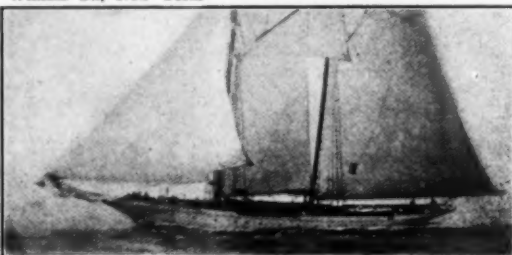
COX & STEVENS

15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



No. 463—For Sale—Steel twin-screw cruising power yacht; 110 x 17.6 x 6 ft. Speed 13-14 miles; two 6 cyl. 100/125 H.P. Standard motors. Two double and two single staterooms, deck dining saloon and large saloon below, bathroom and two toilets, etc. Very able craft. In excellent condition. Cox & Stevens, 15 William St., New York.



No. 148—For Sale—Steel, flush deck, steam auxiliary schooner yacht; 130 ft. overall, 110 ft. waterline, 26 ft. beam, 15.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William St., New York.



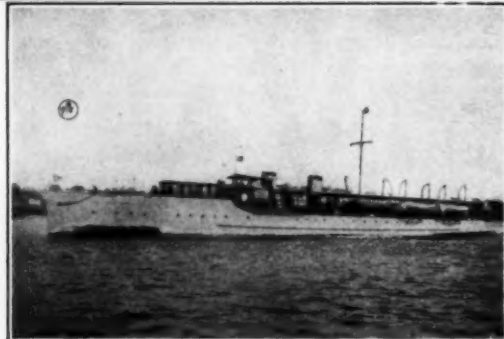
No. 3529—For Sale—Fast bridge deck cruiser; 60 x 10.6 x 4 ft. Built 1916. Speed up to 18 miles; 8-cylinder 215 h.p. Van Blerck motor. Dining saloon containing pullman berth and transom forward; double stateroom aft. Cox & Stevens, 15 William Street, New York.



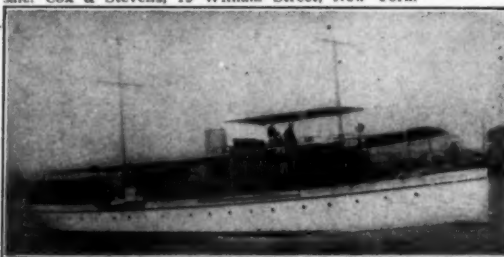
No. 639—For Sale or Charter—Steel, twin-screw power yacht; 111 x 21 x 4 ft. Speed 12-14 miles; Standard reversible motors. Exceptional accommodation; five double staterooms, two bathrooms, large living room, etc. Price Low. Cox & Stevens, 15 William Street, New York.



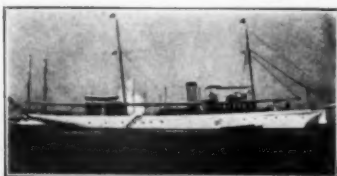
No. 2758—For Sale—Most desirable up-to-date 65 ft. cruiser available. Speed 11-12 miles. Remarkable accommodation, including deck saloon forward, dining cabin, double and single stateroom and bathroom aft. In splendid condition. (Has not been in Government service.) Cox & Stevens, 15 William Street, New York.



No. 978—For Sale—High speed, triple screw, oil burning steam yacht; 165 x 16 x 6 ft. Speed up to 30 miles. Deck dining saloon, four staterooms, etc. Low figure accepted for immediate sale. Cox & Stevens, 15 William Street, New York.



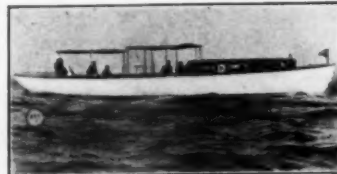
No. 1796—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William St., N. Y.



No. 154—For Sale—Modern 130 ft. flush deck steam yacht. Speed 14 knots; triple expansion engine. Dining saloon and smoking room on deck, 4 staterooms, 2 baths, three toilets, etc. Excellent condition. Price low. Cox & Stevens, 15 William St., New York.



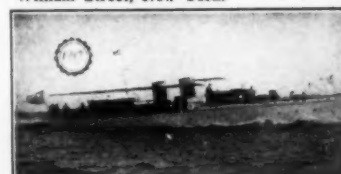
No. 3032—For Sale—Desirable twin-screw cruising power yacht; 80 x 13.3 x 4.6 ft. Speed up to 14 miles; two 6 cyl. 60/90 H.P. Sterling motors. Two double staterooms, dining saloon, bath and two toilets, etc. Cox & Stevens, 15 William St., New York.



No. 627—For Sale—Attractive Lawley Built Day Boat; 53.5 x 10.3 x 3 ft. Speed 11 miles; 32/37 H.P. Standard motor. Best construction. Sleep 4 comfortably. Large cockpit. Low price. Cox & Stevens, 15 William St., New York.



No. 3427—For Sale at Low Figure—Fast, roomy, twin screw cruising power yacht; 74 x 14 x 3.9 ft. New 1916; Lawley built. Speed up to 16 miles; two 6 cyl. "Speedway" motors. Large saloon, three staterooms, shower bath, etc. Cox & Stevens, 15 William Street, New York.



No. 1997—For Sale—Cruising power yacht; 81 x 12 x 4 ft. Speed up to 15 miles; 6 cyl. 100-120 H.P. "20th Century" motor. Dining room, three staterooms, toilet room, etc. Reasonable price. Cox & Stevens, 15 William Street, New York.



No. 3560—For Sale—Fast Bridge deck cruiser; 45 x 10.6 x 3.6 ft. New 1917. Speed 18 miles; 125 H.P. 6 cyl. Sterling motor. Double stateroom, saloon, galley, toilet room, etc. Price reasonable. Cox & Stevens, 15 William Street, New York.

NAVAL ARCHITECTS
ENGINEERS
BROKERS
MARINE INSURANCE

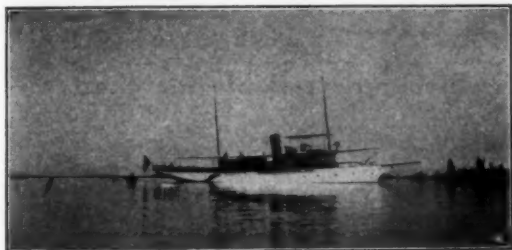
GIELOW & ORR

52 BROADWAY, NEW YORK

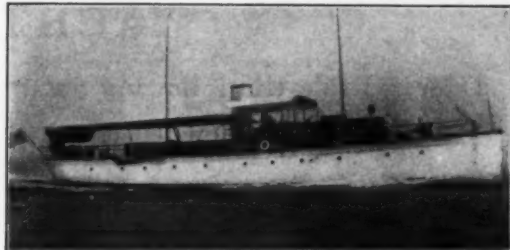
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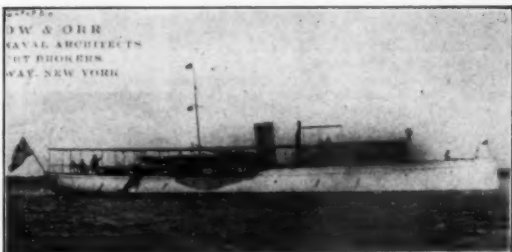
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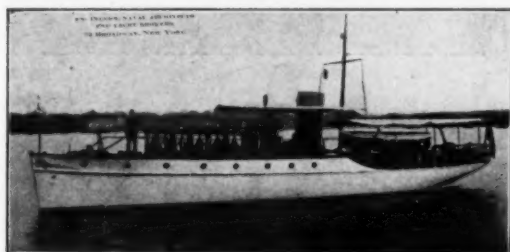
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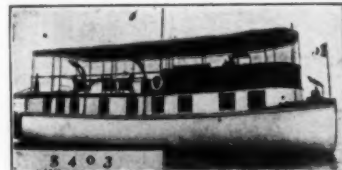
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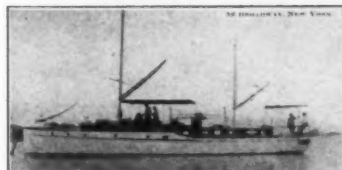
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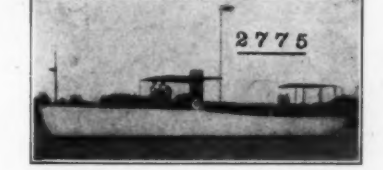
No. 5951—For Sale—40 ft. Hand express cruiser. New 1917. Van Blerck motor. Speed 20 miles. Best construction. Able sea boat. Fully equipped. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



No. 3957—For Sale or Charter—Attractive 75 ft. cruiser, beam 13 ft., draft 3 ft. 6 in. Standard engine, speed 10 knots. One double two single staterooms. Accommodate five persons. Electric lights, hot water heat. Bargain. Gielow & Orr, 52 Broadway, New York City.



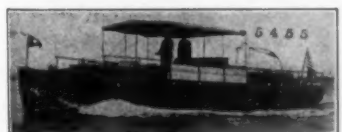
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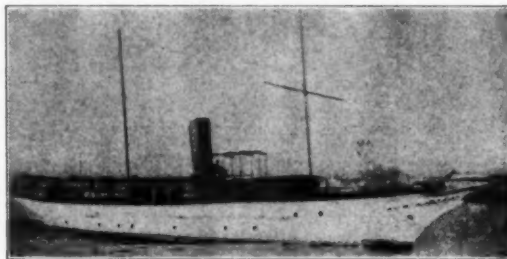
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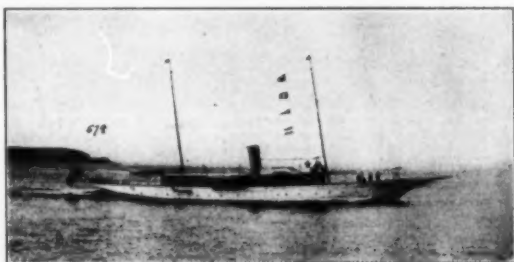
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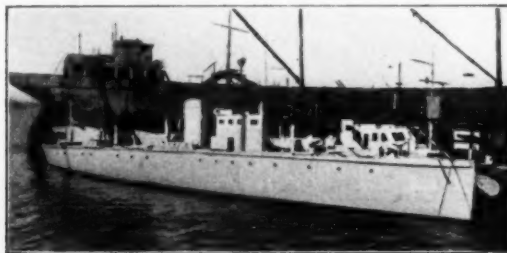
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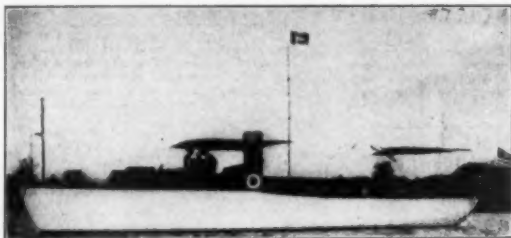
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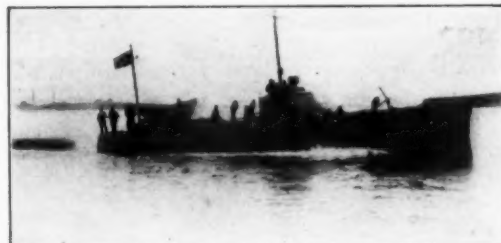
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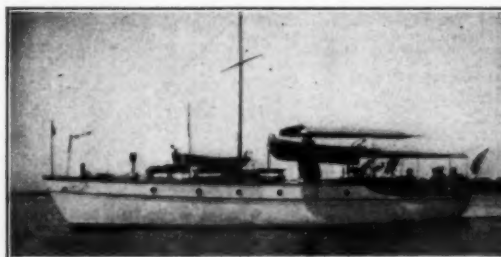
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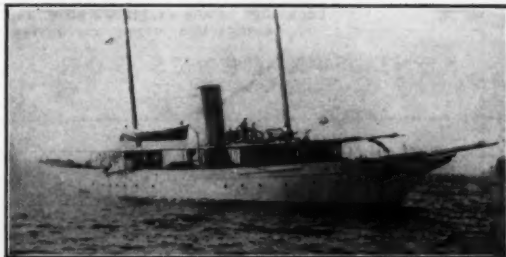
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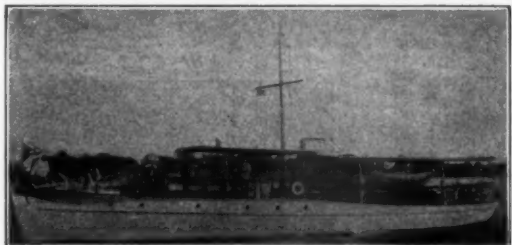
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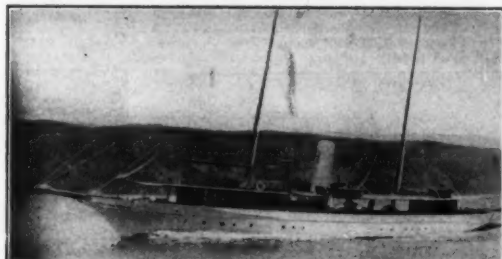
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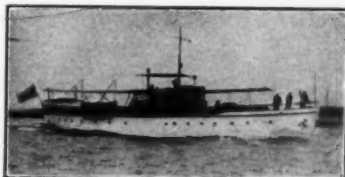
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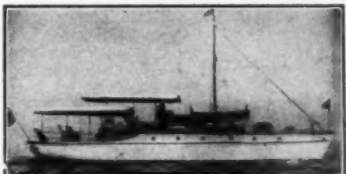
No. 2161—For Sale—Raised deck cruiser, 40.7 ft. x 9.6 ft. x 3.6 ft. Loew-Victor engine. Price reasonable.



No. 1736—For Sale—Twin screw power yacht, 97 ft. x 16 ft. 7 in. x 3 ft. 6 in. 4 staterooms, bath room, deck dining saloon, etc.



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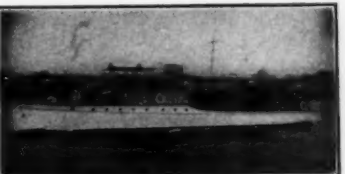
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No. 2386—New Patrol type, 54 x 11.5, eight cylinder Van Blerck, speed 17 miles.



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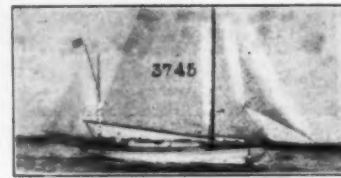
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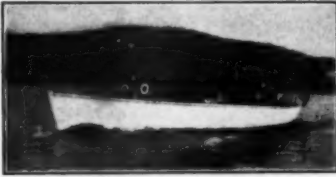
2031—40 foot V-bottom Cruiser. Sleeps six. Speed 12-15 knots.



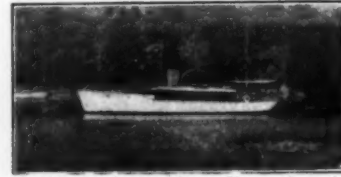
3745—50 foot auxiliary yawl. Three staterooms. Two berths in main saloon. Speed 8 miles.



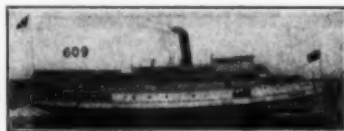
848—75 foot cruiser. Two double staterooms, main saloon, bath, etc. Standard motor. Speed 12 miles.



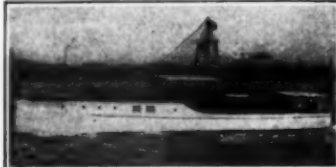
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1899—63 foot power yacht. Two staterooms, two Pullman berths in main cabin. Bath. Speed 18 miles.



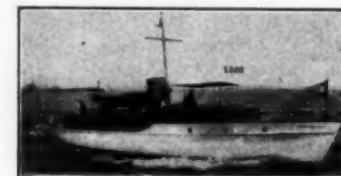
1784—Sale or Charter—62 foot houseboat cruiser. Two double staterooms, main saloon and dining saloon. Sleeps eight. Bath. Speed 9 miles.



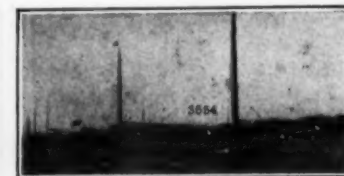
4225—Sale or Charter—Power houseboat 51 ft. x 48 ft. x 15 ft. 5 in. x 3 ft. Three staterooms, two berths in main saloon, toilet, etc. 32-37 H.P. Standard Motor. Speed 8 miles. Electric light, etc.



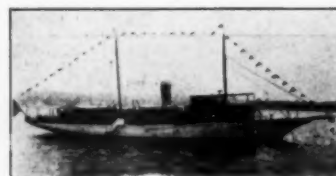
3760—Keel schooner 82 ft. x 52 ft. x 16 ft. x 10 ft. 5 in. Two double staterooms, two berths in main cabin, toilet, etc. Fast and able. Has racing record.



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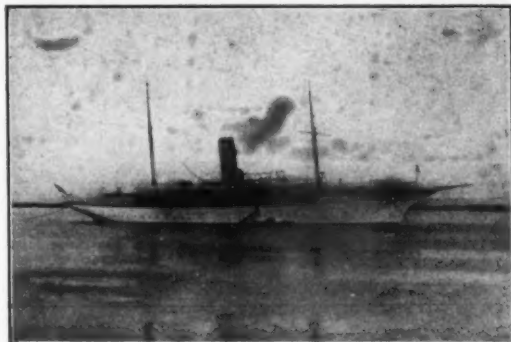
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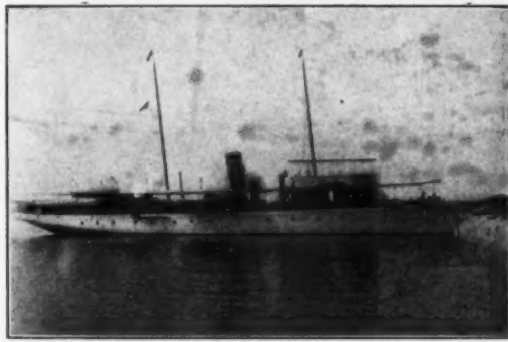
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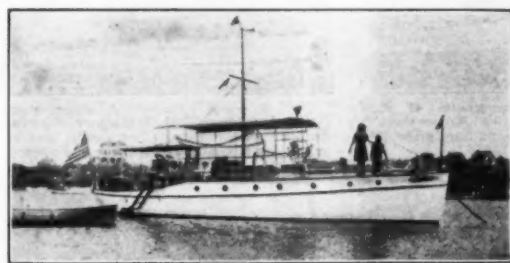
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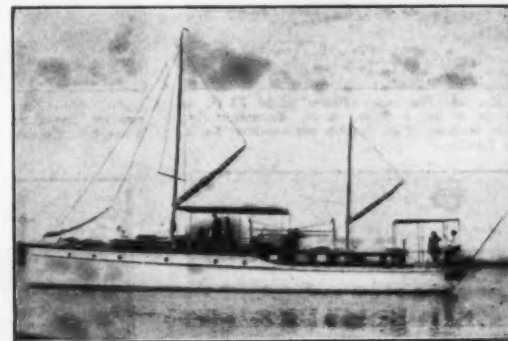
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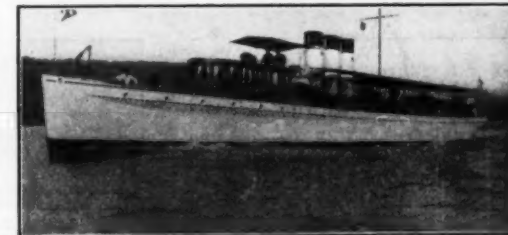
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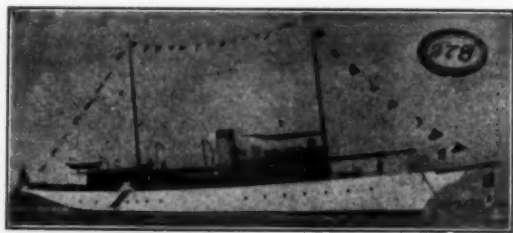
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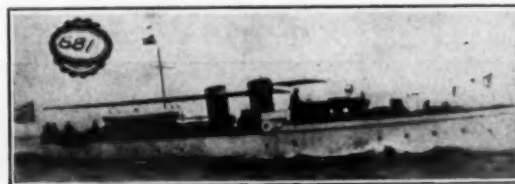
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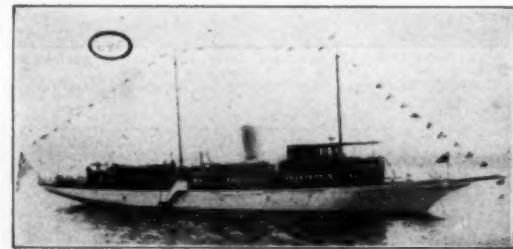
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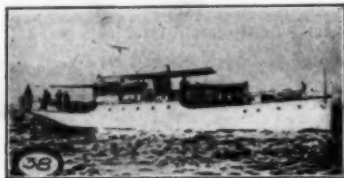
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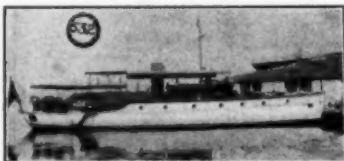
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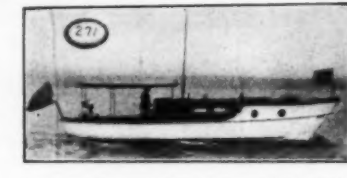
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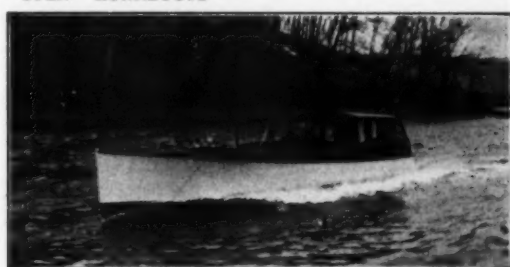
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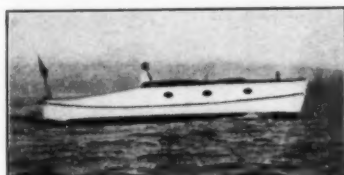
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FOR SALE—Motor Boat, 36 ft. by 10 ft. by 4 ft. 6 in. with 15 H.P. engine and Auxiliary Sail. Complete with electric lights, etc. Sleeping accommodations for 4 in cabin and 2 in engine room aft. Gas tanks for 165 gal. and all in A-1 condition. H. W. Britney, North Colony St., Meriden, Conn.

BOSCH MAGNETOS—All types \$15.00 each and up—Coils: Remy-Splittorf—Delco and other types \$5.00. Low Tension Magnetos all models \$5.00 each and up. Presto Tanks \$5.00—Lighting Generators \$9.00. Starters. Carburetors. Switches. Steering Wheels, etc. Auto Motors, both water and air cooled all sizes. Write for late bargain bulletin second-hand Auto material suitable for all purposes. Johnston, West End, Pittsburgh, Pa.



For Sale: Length 28 ft. 3 in., beam 6 ft. 6 in., draft 3 ft., double ended smooth skin cedar planking, copper fastened. 12 H. P. engine. Cabin 4 ft. 8 in. head room, two bunks with 4 in. kapoc filled canvas cushions. Sands under water toilet in separate compartment. Cabinet for food and cooking. Comfortable cruiser in good condition. Fully equipped. G. O. Carleton, 80 Maiden Lane, N. Y. C.

1-40 to 50 horse-power Peerless marine engine, 4 cylinders; fully equipped with clutch, magneto, and coil; motor only in use 2 weeks; condition practically new. Price upon application. Address P. O. Box 38, Elizabeth, New Jersey.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

FOR SALE—35-foot Hand V Bottom Cruiser with 50-70 H. P. Brennan motor; practically new. Would consider trading for a smaller boat. C. A. Donovan, 160 Berkeley Street, Lawrence, Mass.

FOR SALE—Bargain—Six cylinder, 40-60 H.P. Pierce Budd speed engine, or might trade for medium duty engine. Ernest Merrow, Hyde Park, Mass.

Owner moved to California will sacrifice mahogany runabout. Boat just thoroughly overhauled, ready for launching. Furnished in wicker, excellent engine. Worth \$2000 but will sell for best offer over \$750. See Henry Halsted, Milton Point, Rye, N. Y.

MOTOR BOAT—26 x 7, without engine, cheap if taken at once. H. A. Elander, Bainbridge, New York.

WANTED—SALE—Cabin cruiser, accommodate four or five. Must be well equipped, in first class condition and a bargain for cash. Paul Fitzpatrick, 1764 Broadway, New York.



For Sale—24 ft. x 5 ft. 6 in. two-step mahogany hydroplane equipped with Sterling Model B 8-cylinder 5½ x 6 motor, 1½ x 1 gear box, special universal joint, finest equipment, speed 40 miles, well found. Located Thousand Islands. Exceptional bargain. Will sell hull or motor separately. R. J. Powell, 411 Canal St.

WANTED TO CHARTER

Fishing schooner, Nov. 15 to Dec. 30th, 1919. 75 to 100 ft. long, 6 to 8 feet draft. Auxiliary preferred. Reply with full details to
R. S. WARD
172 Harrison Street, East Orange, New Jersey.

Motor boat hulls, from 12 to 50 ft., all styles, with and without power, at reasonable prices. Good used engines, all types, cheap. We can offer you a good bargain in a complete motor boat or motor only. Tell us what you would like to have and we will quote our lowest price. Atlantic Supply Co., Long Branch, N. J.

FOR QUICK DELIVERY, at low prices, high grade, heavy duty, marine crude oil engines of 40, 60, 75, 85, 112 and 150 B. H. P. Recent changes in owner's plans makes these engines available. Jacobson Engineering Co., 5 Second Ave., Rensselaer, N. Y.

FOR SALE—Cabin Cruiser about 30 feet long, running water, electric lights, 2 cylinder, 2 cycle engine, 15 H.P., 2 gas tanks, cockpit snugly enclosed with awning, equipped with running lights, anchor, etc. E. P. Eaton, Sag Harbor, New York.

Marine and automobile engines 1 to 100 H.P. Best makes—good condition—very low prices. State your power needs. We take engines in trade. What have you? Magnetos, coils, carburetors, mechanical oilers, water pumps, etc. Also car parts of every nature—sacrifice prices. Write about your requirements.

Badger Motor Company, Milwaukee, Wis.

When writing to advertisers please mention MoToR Boating, the National Magazine of Motor Boating

THE MOTOR BOATING MARKET PLACE

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Cut one inch deep, one column wide.....\$2
Cut 1½ inches deep, 1½ columns wide.....\$5
Cut 2½ inches deep, three columns wide.....\$15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month

Please mention MoToR Boating.



A RARE OPPORTUNITY—Owner forced to make unusual offer to dispose at once of gas-power yacht, illustrated above. Beautiful, snappy lines. Staunch and seaworthy, combines speed and power. Easily handled. Roomy cabins appointed in excellent taste, with every possible comfort. Can be seen, upon application to owner, at Essington Shipbuilding Plant, Essington, Pa.

Specifications: 80 ft. long, 11½ ft. beam; 125 h.p. Standard engine. Sleeping accommodations for eight. Built in 1912, at a cost of \$15,000. Will sell to quick buyer for \$5,000. No duties. Wm. W. Miller, Cor. Sixteenth and Reed Sts., Philadelphia, Pa.



FOR SALE or CHARTER—60 ft. cruiser, two double state-rooms, dining room, galley, fore-castle. Inquire of Morgan Barney, 29 Broadway, New York.



FOR SALE—39 ft. 9 in. x 10 ft. x 3 ft. Cabin cruiser or day boat. 25-30 Oxford motor. Speed 10-12 miles. Electric lights, nice toilet. Very able. Full inventory. Excellent condition. Price \$1500.00. Richard E. Beckert, 9 Cornhill, Boston, Mass.

SALE OF U. S. NAVAL VESSELS. (Motor Boats and Yachts). Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, June 5, 1919, when they will be publicly opened, for the purchase of Motor Boats and Yachts, ARCADY, now at New London, Conn.; CELERITAS, now at Newport, R. I.; DRUID, now at New London, Conn.; APACHE, now at Key West, Florida, and KANGAROO, now at Key West, Florida. Exact location may be ascertained from Commandant of the District wherein located, and should be obtained before making trips for inspection. Appraised values: ARCADY, \$12,500; CELERITAS, \$10,000; DRUID, \$60,000; APACHE, \$15,000, and KANGAROO, \$15,000. The sales will be for cash to the bidders offering the highest price, the NAVY reserving the right to reject all bids. Forms of proposal and bond, and information concerning the vessels and the terms and conditions of sale may be obtained upon application to the bureau of Supplies and Accounts. JOSEPHUS DANIELS, Secretary of the Navy. 4-28-1919.

HOUSEBOAT FOR SALE AT BARGAIN. Roomy and comfortable power houseboat. Now located in Florida. Main deck contains galley, engine room and crew's quarters, with large dining cabin and main saloon. Upper deck contains three large roomy staterooms and one single stateroom all equipped with regular beds. Bathroom with all modern and up-to-date fixtures. Standard engine in good condition. Completely equipped with cushions, curtains, carpets, linen, silver, china, glassware and crockery. For quick sale will sell at decided bargain. Further particulars furnished by Jos. A. MacDonald, 614 Monroe Ave., Plainfield, N. J.

**Trimount
Whistle Blower Outfits**
Blower runs by friction
contact with engine fly-
wheel. Whistle of brass,
nickel-plated.

Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., East Dedham, Mass.)

**Trimount
Rotary Hand Bilge
Pumps**
All bronze composi-
tion. Suction lift 6 to
20 feet. A lifelong
convenience.

Made in 3 sizes.



Fifty-foot Speed Cruiser; 30 m.p.h. Construction, mahogany, by world's premier builder. Power plant, two 75 h.p. Loew-Victor six-cylinder motors; electric lighting and starting. Two cabins accommodate six; toilet. Condition new. Bargain price, \$5,500.00. Address Box 451, New York Athletic Club.

SALE OF U. S. NAVAL VESSELS. (Motor Boats and Yachts)—Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, June 5, 1919, when they will be publicly opened, for the purchase of Motor Boats and Yachts, J. REYNOR & SON, now at Old Point, Virginia; NERITA, now in the Fifth District, Hampton Roads, Va.; POLLY, now at New Bedford, Mass.; CORONET, now in the Marine Basin, New York; EAGLE, now at Naval Hospital, New York; JOYANCE, now in the Marine Basin, New York; REPOSO, now at Charleston, S. C. Exact location may be ascertained from Commandant of the District wherein located, and should be obtained before making trips for inspection. Appraised values: J. REYNOR & SON, \$7,000; NERITA, \$12,000; POLLY, \$5,000; CORONET, \$7,500; EAGLE, \$10,000; JOYANCE, \$12,000; REPOSO, \$5,000. The sales will be for cash to the bidders offering the highest price, the NAVY reserving the right to reject all bids. Forms of proposal and bond, and information concerning the vessels, and the terms and conditions of sale may be obtained upon application to the bureau of Supplies and Accounts. JOSEPHUS DANIELS, Secretary of the Navy. 4-28-1919.

FOR SALE—35 ft. Auxiliary Sloop, Ariel. 15 H.P. Heavy Duty Buffalo. Suitable for houseboat or Southern cruising. Reasonable. Apply D. W. Van Derveer, 632 Conover Ave., Long Branch, N. J.

FOR SALE—24 ft. Hand V-Bottom Boat. Speed 20-22 miles 4 cylinder, 4 cycle, Cadillac motor, electric starter. Practically new. Will sell one-third original cost. Box 60 MoToR Boating.



FOR SALE—Motor yacht, length 55, beam 11, draft 38 inches. Recently replanked. Ralaco 5 x 7, 4 cylinder, 4 cycle, heavy duty motor, just factory rebuilt. Boat thoroughly overhauled at cost of \$700. Speed 10-12 miles. Sleep seven. Fully furnished and equipped, ready to go anywhere. Sacrifice \$2500. Worth \$6500. Cash only. Dr. Schefcik, La Salle Bldg., Minneapolis, Minn.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

MOTOR BOAT—30 ft. x 8 ft. beam. Glass cabin forward and standing roof with canvas curtains aft. White oak 1½" frames, spaced 8"; 1¼" cedar planking; copper riveted and brass screws; 1½" mahogany transom, decks and sash. Trimmed with oak. All bright finish. 60 gallon heavy copper gasoline tank. Toilet. Complete equipment including bright finished tender. Peerless Marine Engine 16 H.P.—4 cycle. Practically new. Cost \$2200. Will sacrifice for \$1000. J.P., 53 Grove Avenue, Near Palace Theatre, Port Richmond, Staten Island.

FOR SALE—The Curtiss-Willis Co., 30 Church St., New York. 8—360 H.P. Duesenberg Marine Engines, new, each \$3,000, Cost \$5,600. 4—240 H.P. Diesel Engines, new, each \$15,000, Cost \$31,313. 6—100 H.P. Fairbanks-Morse Semi-Diesel Marine Engines, new, each \$7,000. 2—25 H.P. Fairbanks-Morse Semi-Diesel Marine Engines, stationary, new, each \$1,500. 1—72 ft., 35 mile, motor boat, new, cost \$55,000, price \$15,000. Also motor boats, chain, anchors, wire rope, and marine equipment.

FOR SALE: Nicely appointed one-man control house-boat. Suitable for lake or river use. Boat is 56 feet long and 12 feet wide. First deck has two staterooms, bath, diningroom, kitchen, two servant bunks. Second deck: large sun parlor and open deck. All mahogany finish, brass fixtures and trimmings. Equipped with a 40-horse power marine motor. One K W generator. Boat has pneumatic control from deck. Furniture for boat if desired. If interested, inquiries in writing may be made to the undersigned and appointments made: Address:

C. GEO. KROGNESS
Care The Minneapolis Tribune
Minneapolis, Minn.

THE MOTOR BOATING MARKET PLACE

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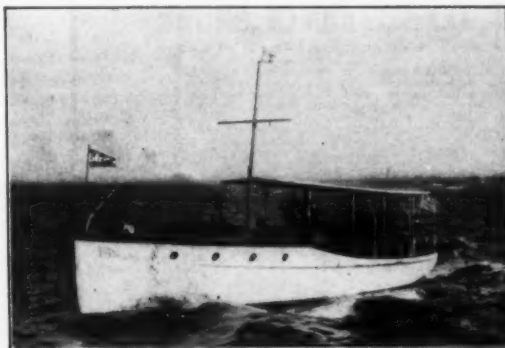
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Cut 1½ inches deep, 1½ columns wide..... \$5
Cut 2¼ inches deep, three columns wide..... \$15

Opportunities for the Motor Boatman

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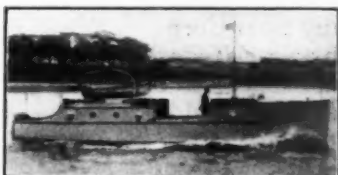
FOR SALE—No. 557—Very attractive 68 ft. yacht in excellent condition. Speed 14 miles. 3 staterooms, shower, etc. Price very reasonable. Further particulars from Harry W. Sanford, Yacht Broker, 501 Fifth Avenue, New York.



FOR SALE—Used 45-ft. ELCO Standardized Cruiser 4-cylinder Standard Engine fully equipped and in commission. For details apply THE ELCO WORKS, Avenue A, Bayonne, N. J.

If You Want a New Boat

an advertisement on this page will sell your old one for you. See rates above. Forms close tenth of month preceding date of issue.



EXPRESS CRUISER—45 x 10 x 3. Hand V bottom. 125 h.p. Sterling. Speed 18 miles. Practically brand new. Will be delivered in commission complete. Sell cheap. Southern Yacht Agency, American Building, Baltimore, Md.

STEAM YACHT—Steel. 150 feet. Fast and able. One double and four single staterooms. Deck saloon forward. Deck dining room aft. Condition A-1. Will sell cheap or charter at reasonable rate. Southern Yacht Agency, American Building, Baltimore, Md.

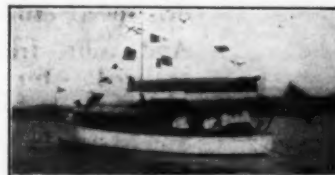
EXPRESS CRUISER—50 x 8.6 x 3.2. Bowes & Mower design. Double skin mahogany hull. Van Blerck Engine. Speed 20-25 miles. A high class boat extensively built and embodying all the latest ideas. Perfect condition. In commission. Price reasonable. Southern Yacht Agency, American Building, Baltimore, Md.

WANTED—Cabin Cruiser any length up to 32 feet, with or without engine. Speed unimportant, on or near Lake Erie. Address Box 31, MoToR BoatinG.

FOR SALE—Cruiser, 40 x 11. Built for owner 1917. Equipped as completely and luxuriously as any yacht twice her size, as much space as average 50 footer. Bargain at \$15,000. Mr. Gates, 601 West 180th St., New York.

High Speed Hulls, mahogany and cedar. Small up-to-the-minute Express and Water cars, suitable for 20 to 100 H.P. at exceptionally low prices. Bronx Boat Works, foot of Willow Ave. bridge, near East 132nd St., New York City.

FOR SALE—Fifty Continental 6 cylinder engines equipped with Bosch Magneto, Schebler Carburetors, Autolight generators used for demonstration purposes only, never in cars, \$80.00 each F. O. B. Austin, Texas. Walter Tips Co., Austin, Texas.



FOR SALE—Cruiser 36 ft. x 9 ft. x 2 ft. 6 in. Fully equipped with electric lights, running water, toilet, ice box, etc. Two cylinder Standard. L. C. Smith, 506 W. 150th St., New York City.

FOR SALE—Standard motor; 75/90 H.P. entirely rebuilt. All outside fittings new and of latest type, including new ignition. Complete with reverse gear, and two propeller wheels. Price and further particulars from Cox & Stevens, 15 William Street, New York.

FOR SALE—A complete Standard motor, six-cylinder, 8 x 10, completely rebuilt, all latest improvements incorporated. Motor can be seen running on test block at Stork Motor Co., Saginaw. Would exchange and pay cash difference for a raised deck or trunk cabin cruiser 55 to 65 ft. long, Mathews or Lawley build preferred. Must be in good condition and of recent build. Address Robert Gage Coal Co., Bay City, Mich.

FOR SALE on Lake George, N. Y. Motor boat "Erro," V bottom, 24' x 5¼"—25-30 H.P. Erd motor. Speed 17 miles. Seats 9. Fully equipped. A-1 condition. W. E. Henry, Ticonderoga, N. Y.

THE MARKET PLACE

MoToR BoatinG's classified advertising columns are a great market place for the buyer and seller of used motor boats, engines and accessories.

Advertisements for these columns must be received by tenth of month preceding issue, with remittance at the rates quoted at the top of the Market Place pages.

If you have a boat or engine for sale, let the Market Place help you to dispose of it promptly.

NEW AND USED AIRPLANE MOTORS

Use an airplane motor
in your boat
**More Power and Speed
Less Gasoline and
Weight**

Airplane Motors, 30 to 300 H.P.
Lowest Prices.

Send for Bulletin "MG"

U.S. AERO EXCHANGE 14 PARA ROW
NEW YORK CITY

When writing to advertisers please mention MoToR BoatinG, the National Magazine of Motor Boating



If this boat were yours—

Picture the enjoyment—the real pleasure you would get out of this speed cruiser as owner.

And your dreams can all be realized—for this boat—the “Marjo”—is for sale.

She has real power. The guaranteed speed of 35 miles an hour has been exceeded—her trial trip showed an average of 36

miles. The “Marjo” has not been run over 1,000 miles.

Built by the Albany Boat Corp. and equipped with an 8-cylinder Duesenberg Patrol Model engine. The “Marjo” holds the record for the run from Albany to New York. Price, \$7,500. An offer may be submitted—to

JOSEPH McALEENAN, 469 Fulton St., Brooklyn, N. Y.

*Trial trip will be made
for interested party.*



NAVAL ARCHITECTS & YACHT BROKERS

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER

Offices:

Lafayette Bldg., Chestnut and Fifth Sts.
PHILADELPHIA, PA.

COX & STEVENS

Engineers and Naval Architects
Yacht Brokers

15 WILLIAM STREET, NEW YORK CITY
TELEPHONE 1375 BROAD

THE EDWARDS ENGINEERING CO.
NAVAL ARCHITECTS & ENGINEERS

DESIGNERS OF

OIL ENGINED YACHTS

AND

COMMERCIAL VESSELS

18 SO. 7TH ST. PHILADELPHIA, PA.

ELLIOTT GARDNER
NAVAL ARCHITECT

104 South Street, Stamford, Conn.

UP TO DATE DESIGNS

Complete plans, Instructions and Patterns. Latest and most efficient designs in Fast V Bottom Runabouts and Cruisers, Seagoing Cruisers and Auxiliaries, Hydroplanes, Yacht Tenders and Row Boats. State type of boat wanted and write for Blue Prints. Latest thing out for Amateur Builders. A 30 foot V Bottom runabout especially designed to give best results with a Ford Auto Engine. Speed, 16 to 20 M.P.H.

William H. Hand, Jr.
NAVAL ARCHITECT

NEW BEDFORD, MASS.

HAND-V-BOTTOM DESIGNS

Write for 48-page illustrated catalog

FREDERICK K. LORD

NAVAL ARCHITECT

120 BROADWAY NEW YORK

FREDERICK S. NOCK

Naval Architect and Yacht Builder

Marine Railways, Storage, Repairs

East Greenwich Rhode Island

HARRY W. SANFORD

YACHT BROKER

501 FIFTH AVE., at 42nd St., N. Y.

Desirable yachts of all types for sale and charter

Telephone 909 Vanderbilt

Runabouts for He Who Runs

(Continued from page 9)

motor is all-important. The Sterling Engine Company has specialized in motive power suitable for this type of craft and in the illustrations on page 9 types of craft powered with Sterling six-to eight-cylinder motors, capable of maintaining, not simply making, a speed of over 30 m.p.h., are shown. The electric generator on the motor assures current for starting, as well as for the tonneau and exterior lights. The counterbalance crankshaft type of motor is used in all of these graceful craft, to which it is well suited because it minimizes, if it does not altogether eliminate, vibration. These powerful motors are almost noiseless and as all moving parts are enclosed this prevents dirt and moisture from getting in and assures a clean engine compartment by keeping all of the oil and grease in the motor where it will do the most good.

Runabouts of the so-called limousine and sedan type are quite varied. Some are light, with low freeboard and narrow beam for use on protected waters and develop high speed with little power. The type with the heavier hull is designed for coastwise use or on open water. This hull is also higher and wider and the engine horsepower must be more powerful. The high-speed runabout generally is constructed of the V-bottom type, as it does not demand as much drive from the engine, is drier and behaves better in a sea-way and ordinarily has more beam than the round-bottom type, which is most common on the boats making less than 25 m.p.h.

Seating arrangements vary according to the design of the boat, whether it be of the one-cockpit or the two-cockpit type. Naturally in boats of this type protection from the weather and flying spray is important. Nearly all are equipped with glass windshields, which when not in use may be dropped into pockets, where they are protected from breakage. Tops are built along the lines of motor car sedan tops, and while some are of leather, the most rakishly aristocratic ones are of aluminum over the part of the cockpit in which the passengers ride with a leather extension over the driver's seat.

The Sterling people have built their engines for this type of boat with the idea in view of making it as simple of operation as a motor car and understandable for the man who drives a car, and so the engine controls and auxiliary instruments are arranged on the bulkhead or instrument board, which avoids the liability of confusion and mistakes.

No More Marine Disasters

(Continued from page 17)

to give bearings; and directional lines from both vessels drawn on a map in the radio room of the third will intersect at a point which denotes her position. Error may creep in if the latitude and longitude of either of the ships employed as shore stations is inexact. But as the entire operation covers a very short period of time, the movement of the vessels has little, if any, effect on the results obtained. Moreover, on the high seas, slight differences are of no consequence.

TAMS, LEMOINE & CRANE

Yacht and Ship Brokers

Naval Architects

Marine Engineers

52 Pine Street

New York

BRUNS, KIMBALL & CO., Inc.

153-5-9 West 15th St., New York City

Offer over 200 re-built engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Gray-Prior, Doman, Missouri, Universal, 4 cycle; Eagle, Hartford and Arrow, 2 cycle; Missouri heavy oil engines, simple and economical; Burnoil, heavy duty 4 cycle heavy oil engines, quick starting, economical, easy to operate. Write for offer.

SUTTER BROS.

44 3rd Ave., Bet. 9th and 10th Sts., N. Y. C.

Agents for Fay & Bowen-Clay Heavy Duty, Fulton-Stanley, Jones Gears, Wizard Magneto's, K. W. Coils.

Write for our list of rebuilt engines.

Full line of motor boat accessories on hand

A VOID disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard first and high-grade jewel. Every degree circle on dial. Brass and mahogany binoculars. Also new course finder and bearings instrument. Send for descriptive catalog.

EUGENE M. SHERMAN
Box 3 Bellevue, Wash.



The Chemical Fire Chiefs Recommend

Fire-Choke

Thrown from the hand it instantly extinguishes incipient fires. Two sizes, \$3.50 and \$5.00. Send for free sample.

THE FLEXLUME SIGN CO.

1441-45 Niagara St., Buffalo, N. Y.

WE CAN MAKE PROMPT DELIVERY OF
NEARLY ALL SIZES OF THE FAMOUS
EMERSON 2 CYCLE
4 PORT

AT THE OLD PRICE

HERFURTH ENGINE & MACHINERY CO.
Alexandria, Va.

Forgings and Castings

for marine work a specialty. Our experience in this particular field is at your disposal. Get our estimates before specifying on aluminum, bronze and composition castings, also drop forgings of steel and brass.

THE HARLEY COMPANY
Highland Station Springfield, Mass.

Baldrige Reverse
Gear

You can get a Baldrige — the original all-enclosed, time-tested reverse gear — now — for immediate delivery. Booklet "For the Man in the Boat." Free. THE BALDRIGE GEAR CO. Boston, Mass.

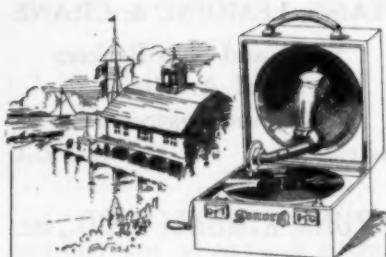
ENJOY
the LURE
of the
WAVES

K D or
Complete



RICHARDSON BOAT CO.

No. Tonawanda, N. Y.



THE INSTRUMENT OF QUALITY
Sonora
 CLEAR AS A BELL
Portable

YOU need this remarkable phonograph, which is of typical Sonora quality.

ABOARD the yacht or trim cruiser music is most acceptable to pass the time away. If becalmed, or if the motor should quarrel with you, the Sonora Portable offers you a source of unalloyed pleasure instantly available.

If you wish to dance, there is no need for elaborate preparations. At the seashore or at the country place, the Sonora Portable is ready as soon as eager hands take up the rugs and lay bare the smooth hardwood floor.

The case of the Sonora Portable is of the finest calfskin, leather-lined, provided with well made spring locks. The trimmings are nickel plated and the weight is only 15 pounds.

The dimensions are 10¾ inches long, 10¾ inches wide and 10½ inches high. A strong leather handle is provided. The motor is of the "double spring" type.

The Sonora Portable, like every other Sonora model, is guaranteed and plays perfectly all makes of disc records, all sizes.

Price \$60

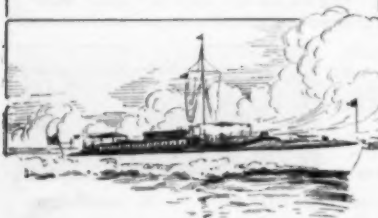
A complete line of upright and period models is available at prices from \$50 to \$1000. Write for catalog No. 18.

**Sonora Phonograph
 Sales Co., Inc.**

George E. Brightson, President
 New York Demonstration Salons:
 279 Broadway
 50 Broadway (Standard Arcade)
 Fifth Avenue at 53d Street
 Toronto: Ryrie Bldg.

DEALERS EVERYWHERE

Sonora is licensed and operates under BASIC PATENTS of the phonograph industry.



Making the Anchor Hold

(Continued from page 30)

away in a locker without ventilation will rot in a surprisingly short time. A boat riding to a manila cable is never brought up with a jerk as with a chain. There is enough give or spring to it to take the strain gradually. It should be bent to the anchor with a round turn—twice through the ring before tying—to avoid excessive chafing.

An ideal combination is a sufficient length of chain for general use to which can be bent a manila cable for riding out blows. This will give the necessary elasticity to ease the strain on the cleat or bit, and the chain will help keep the head of the anchor from being raised as each wave hits the bow of the boat.

The size of the anchor cable, whether chain or rope, should be in proportion to the weight of the anchor. For the small light boat that carries only one anchor a one-quarter-inch chain or three-quarters-inch diameter rope will be of ample size. The larger boats should, if they use chain, have two sizes, one-quarter inch for the smaller and five-sixteenth or three-eighths-inch for the larger. If rope is used, a five-eighths-inch diameter rope for the light anchor and one-inch rope for the heavy anchor will be about right for any boat up to forty feet long. Over this length a one and one-quarter-inch rope would be safer.

Some men make the mistake of having the rope far too large for the anchor. A five-eighths-inch rope has a strength of about 4,000 pounds, and a one-inch rope should stand a strain of 7,500 pounds, both of which are well above the holding power of anchors for which they would be suitable.

The length of cable necessary will depend somewhat upon the depth of water in the territory in which the boat is to be used, but it should never be less than 100 feet and seldom need be over 200 feet. Small motor boats seldom have occasion to anchor in deep water. They generally run into bays or harbors and then anchor near the shore so that water over thirty or forty feet deep is seldom encountered. It is only the larger sea-going boats that ever have occasion to anchor in deep water.

So much for the anchors and cables required. Now, how are the best results to be obtained when in use? In the first place, an anchor should never be picked up and simply thrown over the side to act as the proverbial cat and always land on its feet. It is just as liable to turn over on its way down and foul before it even reaches the bottom. Neither should the anchor be put over while the boat still has headway.

To anchor a boat in a seamanlike manner it should first be headed up into the wind or tide, then stopped and given a little sternway by reversing or allowing it to drift. Then when the anchor is lowered over the side, it will land on the crown and the head will fall toward the boat without danger of fouling.

If there is much wind or sea so that the boat will be continually tugging at the anchor and a rope is used, it should be bent to the anchor with a round turn and wrapped with canvas where it passes through the chock. These two precautions will prevent the rope chafing and add materially to its useful life.

My Ideal Auxiliary

(Continued from page 32)

power question for a similar design. It will be seen that the curve rises very sharply after 8 knots is reached. This could be expected, however, if one had the opportunity to notice the wave formations and change of trim at these higher speed-length ratios. A propulsive coefficient of 50 per cent. was used. This is none too high, due to the excessive amount of deadwood and consequent interference on the flow of water to the propeller.

In fixing the allowable draft, the attempt was made to keep it as low as was possible, due to several bays and inlets into which it had been our custom to sail for a swim and dinner on Sundays. While at first glance the lateral plane may seem a trifle small, due to a small draft, it was filled out forward and aft to counterbalance this defect, and also to bring the center of effort and center of lateral plane into proper relation. In this case the center of effort of the sails comes 25.28 feet aft of No. 0 ordinate and the center of lateral resistance 26.75 feet aft, giving us a lead of 3.2 per cent.

This arrangement and size of the iron ballast casting fitted to the keel is shown on the ballast plan. The displacement of Pirate II to the load waterline is 33.5 tons, the weight of hull and outfit complete was estimated at 12.95 tons, people and soakage at 1 ton, giving 19½ tons for ballast. The external casting will be slightly under 8 tons, thus allowing about 11½ tons to be stowed in the bilge and distributed for the best conditions of seaworthiness.

All in the crew feel that while they have nothing startling or radical in this design, still it fills the bill for their set of conditions, and now that the Kaiser has indirectly, by his sudden departure, given cause for a decreased price in lumber, the coming spring will see a resumption of work on Pirate II, with the prospects of completing her by Memorial Day, 1920.



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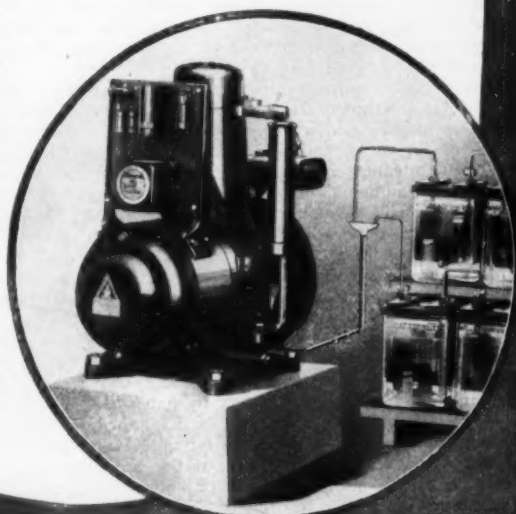
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Hints on Keeping the Motor in Shape

(Continued from page 34)

batteries occasionally, and incidentally, batteries should be located near the generator, and accessible.

While the oiling system on Model F Sterlings is as near fool-proof and self-adjustable as an oiling system can be made, being of the hollow crankshaft force-feed type, it is advisable to watch the oil pressure. A favorite stunt in the past has been to remove hand-hole plates when installing the engine and then do a lot of sawing about the installation. Naturally some chips and saw dust find their way into the crankcase, later into the oiling system, and when the oil pressure mounts to forty pounds or more and a bearing burns out, no one can explain it. For this reason the oil pressure should be watched. It should be carried at about four to fifteen pounds. There is a pressure gauge furnished with the engine and an occasional glance should prove whether or not the oiling system is working properly. After about ten hours running it is advisable to clean the oil filter by unloosening one thumb screw and lifting out the strainer, which can be cleaned in gasoline and replaced in about one minute. The four- and six-cylinder Sterlings require but six quarts of oil in the base, the eight-cylinder requires eight quarts; and, at least once a month, preferably once every two weeks (if the running is continuous) it is advisable to remove the oil from the sump pit and put in another supply. You can tell when the base is full by observing the indicator ball which is attached to a float in the sump pit. When this indicator ball is at the top position, the base is full; and if you continue to pour in more than the required amount of oil, it will simply cause carbon on the rings and plugs. The water pump grease cup should be kept filled with light grease at all times, it feeds automatically.

No particular attention should be paid to the reverse gear, beyond pouring in a quart of oil when starting up for the first time, as this member is lubricated through the hollow crankshaft, and the tail shaft bearing lubrication is also automatic.

If, when installing your engine, the exhaust line had been arranged to lead down and outboard as directly as possible, avoiding sharp turns and water traps, and if the water overflow from the exhaust manifold had been piped into the exhaust line, to cool the discharge, a sufficient distance from the engine so that it could not possibly work back into the motor, the feature should never cause trouble.

If your water intake scoop had been placed just under the turn of the bilge of the boat, and only short pieces of heavy rubber hose used for connections (because long pieces collapse and shut off the water supply), and if a shutoff valve had been installed in this line, you should experience no difficulty with the water intake system; providing, of course, that this valve is turned shut while the boat is at rest any length of time, and turned on again before starting.

Also, if you are operating in shallow water and are drawing sand, it is advisable to have two sources of intake, one higher up on the turn of the bilge, shutting off the lower one when in shallow water.

Never run your motor with the clutch or reverse hand slipping. The adjustment is simple and if you disregard it, nothing but trouble will ensue. The releasing of a single screw, about six turns, and the turning of the adjusting nut one notch in advance, is sufficient to adjust the clutch and prevent it from slipping, but after this adjustment has been made, it is advisable to make it positive by screwing the lock screw tight against the adjusting nut. The clutch is equally easily adjusted and in a similar manner.

While it is never recommended that the valve timing should be altered, in case this action really becomes necessary, the push rods should be adjusted with about .006 clearance on the inlet side and .012 on the exhaust side between the push rods and the valve stems. The compression can be determined by opening the priming cups, leaving but one cylinder closed at a time while turning the engine over by hand. If the engine shows poor compression, valves can be examined by removing through the top of the cylinder after unscrewing the valve caps. It will be necessary to take out the valve spring pin. If the valve shows signs of blowing or poor seating, grind it in with the use of a small amount of fine grinding compound, by inserting a screw-driver, or brace with screw-driver bit, through the opening provided by the valve cap, as there is a slot in the valve for the purpose. Do not turn only one way,

but rock backward and forward, and you can determine when your valve is seated properly, if there is a bright surface completely around the valve without a break. Before reassembling, all valve grinding compound should be cleaned off, and—*grind only when necessary.*

Left hand or regular four-cylinder Sterlings fire 1-3-4-2; the six-cylinder fires 1-4-2-6-3-5, and the eight-cylinder 1-5-3-7-4-8-2-6. Cylinder No. 1 is at the flywheel end of the engine. It should not be necessary to reset the camshafts, and this should be undertaken only by a person familiar with engines, magneto, timing, etc. It is always advisable to study the instruction book when this is undertaken.

Among the things one should be careful to attend to when ready to start the motor for the first time is to fill the oil tank, and the sump pit in the base of the motor; put one quart of oil in the reverse gear housing; oil the magneto, generator and starter with one drop of light machine oil in each cup; oil the rear bearings on the water pump and magneto drive shafts through the small holes on top of the crankcase, using about two tablespoonfuls for each oil hole; put approximately the equivalent of three priming cupfuls in each cylinder, turn the engine over several times by hand to work oil onto the cylinder walls, and also to be certain that the engine turns freely; fill the gasoline tank and open the valves in the gasoline line, and ascertain that all joints are tight and that there are no leaks in the piping. Before the starter button is pressed one should be certain that the clutch is in neutral, and that the magneto switch is in battery position. If these attentions are given the motor, one is assured of having started right.

Assuming that the installation has been taken care of and that the above matters have all been attended to, it is advisable, when the boat is under way, to throw the switch handle to magneto position, and to look at the various gauges, such as oil pressure gauge, ammeter, etc. It should also be noted that the oil supply pump and water pump are working properly.

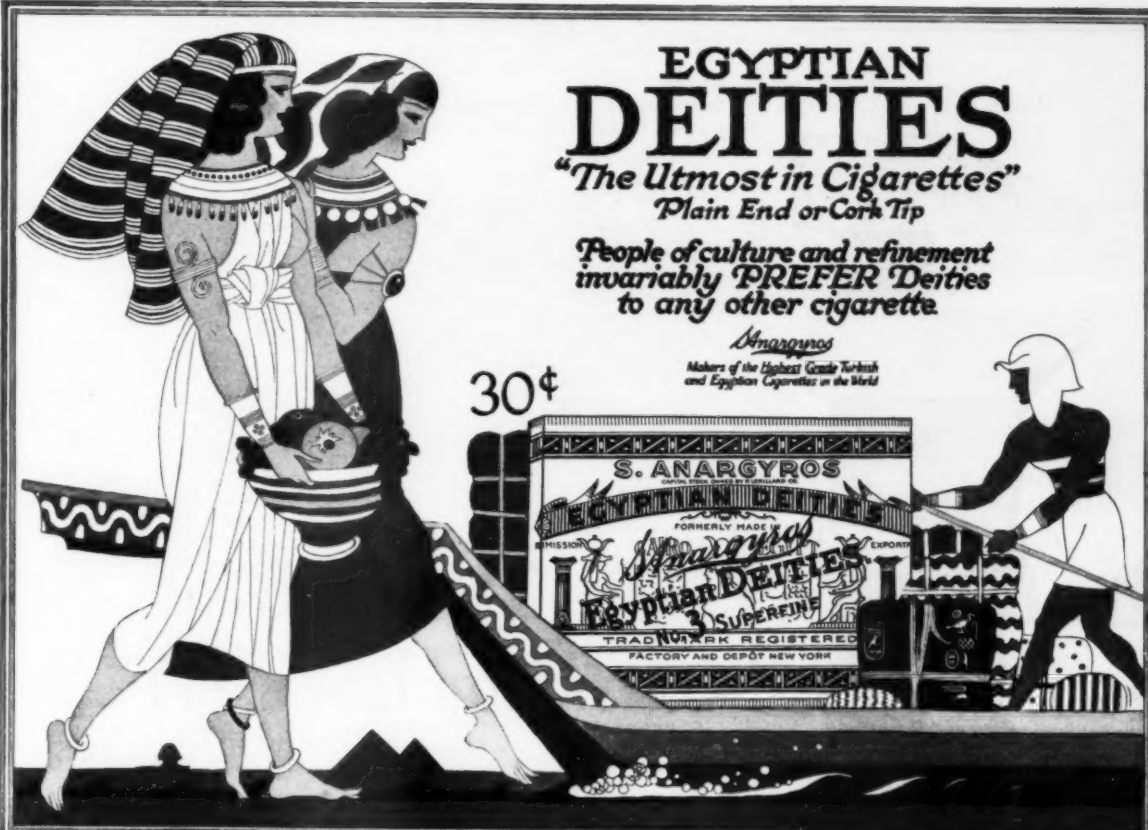
There are several precautions which one should take when running an engine, such as not to race an engine at any time with the clutch in neutral position, not to run the engine over half speed when new, nor to run it at all if the engine is pounding. Frequently the pounding results from a spark advanced too far and is immediately determined by a click in one or more of the cylinders, indicating premature ignition. If the pounding persists after the spark has been retarded, the engine should be stopped and examined so that the trouble may be located.

One of the frequent stunts of mechanics, supposedly familiar with gasoline engines, is to retard and advance the spark and throttle rapidly. If the motor stands it repeatedly, it is conceded to be a good motor. The majority of motors will stand it, so that after all, the practice mostly results only in putting an abnormal strain upon the engine. It is a practice that certainly should be discouraged.

It is inadvisable at any time to encase the ignition wires on these motors. It has been found by experience that moisture collects in casings, particularly in salt water regions, and this water in a short time will eat through the insulation of the wires, causing short circuits and no end of trouble, which is so difficult to locate.

If one takes proper care of an electric system, preventing short circuits, and is careful in regard to the oiling of his motor, he is unlikely to experience motor difficulties other than those accompanied by running your motor at greater revolutions than it was designed for. Sterling high-speed motors operate at their maximum efficiency at 1,400, and indeed the power curve doesn't drop off nor flatten at considerably above that number of revolutions; yet, above 1,400 is a reserve which should never be invaded. We know of Sterlings that are running at 1,600 r.p.m., and are not at all surprised at their efficiency at that speed, yet it is a practice that we do not recommend, excepting in the case of a racing motor intended for higher r.p.m. The lower speed models, such as the F heavy-duty motors, are built to turn not higher than 800 r.p.m. Of course, one can run them at higher speeds, but it is always advisable to fit a propeller that the engine can turn at its maximum r.p.m. This makes a load proportionate at all speeds, and one is less likely to exceed the r.p.m.

(Continued on page 64)



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(Continued from page 40)

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Their performance was revolutionary and meant the opening to motor boats of great areas of shoal and weed-grown waters that had been considered impossible for navigation.

We published two or three articles describing and illustrating the boats in operation—and received over ten thousand inquiries from all over the world, from New Zealand, India and Africa, but mainly from the United States.

Then came the war, and our building facilities were taken over entirely for the construction of high power sea sleds for government service. We could only tell our prospective customers for shoal draught and weedless boats that it was impossible for us to build them.

Now we have taken up the development again and hope to be able to supply the boats in limited numbers during the present summer.

If you have to navigate shoal or swift water at good speed, or wish to run at from 12 to 30 miles through heavy eel grass, or hyacinth or kelp, write us at once and let us study your requirements.

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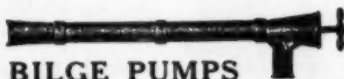
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Write for description and prices.

ANDERSON ENGINE CO.
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Decks Cleared for Action

(Continued from page 39)

Orleans, but as Mark Twain use to say, it doesn't matter where you come from—just so you do. He was engaged in newspaper and magazine work down there, incidentally dabbling in politics in his spare time, having been for four years a member of the State Legislature, a member of the Constitutional Convention that framed the present Constitution of the State, which might explain many of its inconsistencies, and at the time the war broke out was Auditor of the Civil Courts of New Orleans, and doing newspaper work at the same time.

Mr. Koppel enrolled in the Naval Reserve Force with the rank of Ensign three days after war was declared and was assigned for intelligence duties. Desiring more active service than this sort of work offered he volunteered for overseas duty and early in the summer of 1917 was sent abroad, being the first reserve officer of the Navy ordered abroad for permanent duty on the other side. Suffering a nervous breakdown after some months of arduous duty in the submarine zone, he was invalided home and ordered to the Brooklyn Navy Yard for medical treatment. Later he received a physical disability discharge. Not being satisfied to remain out of service with a war going on all around him, he enrolled with the Aviation Section of the French Military Mission to the United States, serving under Major Georges Tulasne with the distinguished French Aces Captain Heurteaux and Lieutenants Soulie, Flaschare, Farre, and Dobelle.

Later, when an opportunity offered to get into the service of the army of his own country, Mr. Koppel resigned from the French service and was appointed an officer in the Adjutant-General's Department of the American Army. Just one week before the Armistice was signed he secured a transfer to the Motor Transport Corps and was recommended for a Captaincy. Upon receiving his release from the Army he accepted a position with *The Brooklyn Eagle* as rewrite man, and a few weeks later was promoted to assist the Sunday Magazine Editor, which position he was holding, while contributing to other magazines and newspapers, when impressed into the crew of MoToR BOATING.

Mr. McKean was born when quite a small boy in New York City, which, of course, was not his fault at all. After the requisite number of years he donned his long trousers and started out to be somebody. That he has eventually succeeded is, we modestly believe, attested to by the fact that he is one of the crew of MoToR BOATING.

Hearing that several of the really great men of the country had been to college, young Robert Clayton, etcetera, chugged his way through Columbia with his muffler open and in 1912 received, with a great degree of pride, his great degree as a M. E. Then the siren call of the witching waves made itself heard and for a year after his graduation he "just cruised." Finding that the engine needs a continual supply of fuel, our young hero undertook to supply it and connected himself with the Perry Advertising Agency, and later with the Williams concern.

A few days after war was declared he exchanged his civilian title of Mister for the Naval one of Chief Boatswain's Mate in Class Two of the Naval Reserve. After a brief preliminary service he was placed in command of S.P.721, the former motor boat Linta, and remained in command until December, 1917, when he was promoted to Ensign in the Reserve and order to Annapolis for a short course of instruction. When this had been completed he was raised to Ensign in the Navy (temporary) and detailed to the battleship New Hampshire. Here, by the excellence of his service, he won further promotion, and in November, 1918, was made a Lieutenant, j.g. It was in February 1919, that the eagle eye of Skipper Chapman singled him out and his shanghaiing followed.

Mr. Monahan is also a university man, taking his fling at the high-brow life at Georgetown University, and is now to enjoy some high-life MoToR Boating. After his Georgetown days he was with the Taylor-Critchfield Advertising Agency, and then *The Chicago Tribune* lured him away. Located on the borders of a great lake, it was only natural that Sailor Monahan should become enthusiastic about MoToR Boating and so, when the opportunity presented itself he enlisted in the Naval Auxiliary Force in Chicago in April, 1918.

Due to the number of enlistments and lack of equipment, he was not called into active service until August, 1918, and then after a period of training at Camp Farragut, Great Lakes, Ill., was sent to the Municipal Pier, Chicago, where his education in navigation was polished off. Later came orders sending him to Cleveland to be placed on one of the ore boats that ply between Lakes Erie and Superior, and after eight weeks of a real sailor's life he took his examination in Cleveland for a commission—then came the Armistice.

The *Tribune* called him back, but MoToR BOATING grappled him aboard, and now he is riding along, and says he likes it.

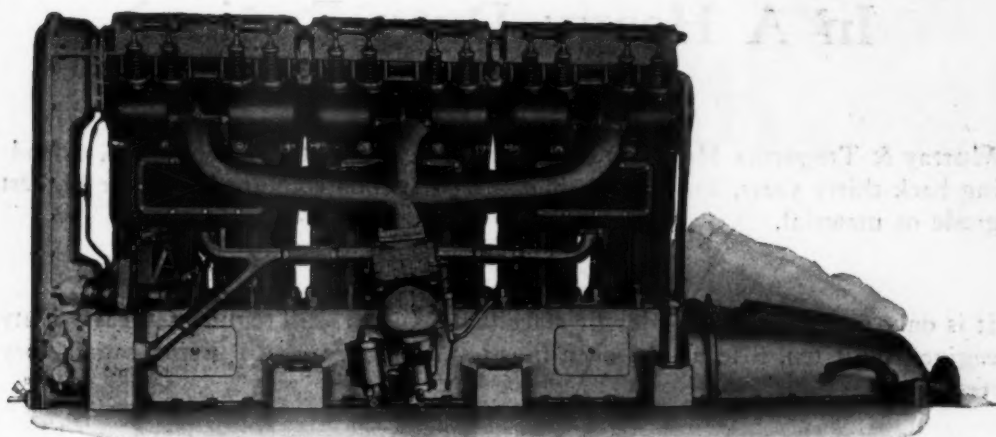
Hints on Keeping the Motor In Shape

(Continued from page 60)

Lastly, in laying up an engine for the winter an owner should be careful to cover crankshaft, camshaft, gears, and pistons with heavy oil; to remove and grease the valve stems and seats; carefully covering all exposed steel parts, shafts, couplings, castle nuts, etc., with oil to prevent rusting. Water should be drawn from cylinders, exhaust manifolds, carburetors and water pump through the petcocks provided for the purpose. This rule will be readily understood by anyone who has experienced a cracked casting when ready to begin a pleasurable season.

Advertising Index will be found on page 112

The Acme of Reliability



Plus Power

The new Model J-6, 6-cylinder, 300-400 h.p., Murray & Tregurtha High Speed engine embodies the latest practice in marine engine design.

The factor of weight per horsepower has been kept extremely low by the liberal use of aluminum alloys and the refinement of every part of the engine, without losing any of the rugged strength that has characterised M. & T. engines for thirty years. Double overhead valves, mechanically operated, and four separate spark plugs per cylinder.

The Model J-6 is designed to meet the demand of the discriminating yachtsman who desires his power plant to be absolutely the last word in power, plus the reliability inherent in the highest grade material and workmanship.

We have an attractive proposition
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What Do You Look For In A Heavy Duty Engine?

First—*Strength!*

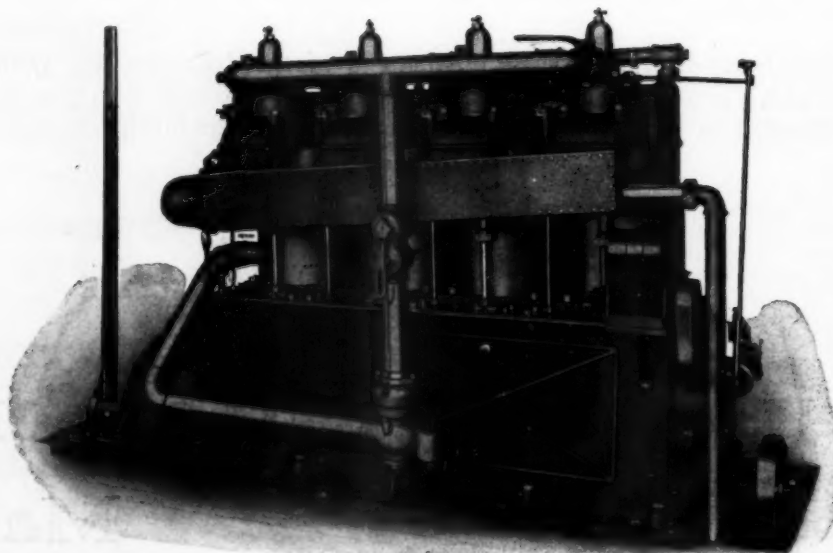
Murray & Tregurtha Heavy Duty models have international reputation, extending back thirty years, for rugged, honest construction combined with the highest grade of material.

Second—*Service!*

It is only necessary to consider the fact that Murray & Tregurtha Heavy Duty engines, built ten, fifteen, and even more, years ago, are still giving satisfactory service.

Model E-2, 2 cyl, Bore 6½, Stroke 8, 18 H.P. at 425 R.P.M. . . .	\$1000.00 F.O.B. Factory
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" E-4, 4 cyl, Bore 6½, Stroke 8, 40 H.P. at 450 R.P.M. . . .	\$2200.00 F.O.B. Factory
" E-6, 6 cyl, Bore 6½, Stroke 8, 60 H.P. at 450 R.P.M. . . .	\$3250.00 F.O.B. Factory
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ATWATER KENT

SCIENTIFIC IGNITION

On U.S.A. Fifty-two Foot Express Cruisers

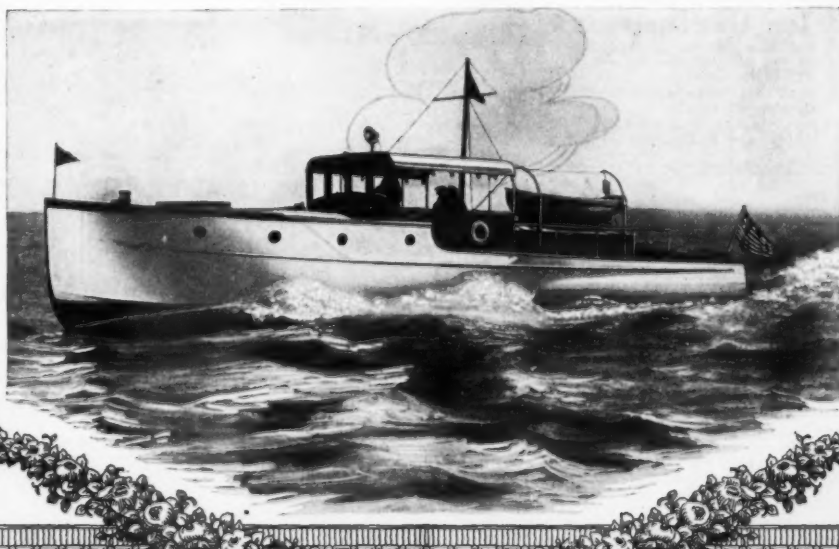
These fifty-two foot Express Cruisers were purchased last year by the United States Army and are now in service in the Panama Canal Zone. They were built by the Great Lakes Boat Building Corporation and have an eight-cylinder Model "J" Van Blerck engine. Naturally Atwater Kent Scientific Ignition was chosen as standard equipment.

Atwater Kent Ignition will replace your magneto with a more dependable form of spark energy.

Our Type H System is especially adapted for marine motors and will operate either from dry batteries (a season's operation from a set of six), a separate storage battery or a storage battery generator charged. Furnished for 1-, 2-, 3-, 4-, 6- and 8-cylinder motors.

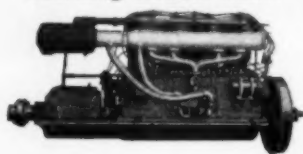
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Regal Marine Engines

Have 18 years successful building behind them



The line is very complete, sizes ranging from 2 H.P. to 50 H.P. The engines can be equipped with any kind of ignition desired and are constructed to burn gasoline, kerosene or distillate.

Write for catalog and prices.

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Gear Pulling Made Easy



Says the Master Mechanic. The Greb Automatic Grip Puller is a One-Man Puller—Quick-acting, strong and simple in the extreme. May be locked in any desired position. A combination of two or three arms. Heavy Duty Size capacity 1" to 18"—Junior size capacity 1" to 7". Two sets of jaws furnished with each size.

Ten Days' Trial If your dealer or have them we will send you one. Try it ten days. If not satisfactory, return to us and we will refund.

THE GREB CO., 225 State Street, BOSTON



You Can Build Your Own Boat

and save 2/3 the cost by the **BROOKS K. D. SYSTEM.**

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"The famous Davis Dink to be known from now on as the Sandusky Dink" The Ideal Tender



For many years the famous "Davis Dink" has been accepted by the boating world as the ideal tender for any boat. Owners of the Anstrach sailboat have been among the first to specify "Davis Dinks" when approving plans and specifications.

From now on the "Davis Dink" is to be known as the "Sandusky Dink". The change is in name only—the quality of material and excellence of design will remain the same. "Sandusky Dinks" are light, strong and serviceable. Both row and power are continually in stock in sizes from 8 to 16 feet. Send for catalog today.

Sandusky Boat & Cabinet Works, Sandusky, Ohio

Take the Tax Off Motor Boats

(Continued from page 62)

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(Continued on page 72)

More Power More Speed With Less Gasoline!



Every boatman wants more power, more speed—every boatman desires *maximum performance* from his engine. Through a process called decolization, Eccolene renders gasoline more completely combustible under compression in the cylinder. Eccolene makes the engine a more highly efficient factor in the operation of the motorboat. It decolizes the vapor and thus guards against the formation of carbonizing elements, at the same time acting as a lubricant. Carbon deposits are reduced, speed and power increased, smoke and noise lessened, over-heating minimized, and mileage per gallon of fuel is increased.

A Smooth Motor

Every ounce of gas used is made to produce to its fullest capacity. Eccolene insures almost perfect combustion. It will give new life, power, *smoothness*, quick response and greater acceleration to your engine.

Not Injurious

Every carbon forming element of your fuel will be turned into actual power by Eccolene. With all its vigorous action, Eccolene is not *injurious*. It cannot damage any metal, because it is composed of smooth oils.

Greater Speed

Every particle of your gas will be burned, full ignition takes place. It prevents waste of gas or power.

1 Quart
\$2.00

ECCOLENE

1 Gallon
\$7.00

SEND FOR BOOKLET

GET THE FACTS



This picture shows the proportion of fuel that is wasted when using plain gasoline. It is wasted by not being burned, and a badly carbonized motor is the result.

SALES DEPARTMENT
Edward A. Cassidy Co., Inc.
280 Madison Avenue New York

MANUFACTURERS
The Eccolene Company
Detroit Michigan



This 5 gallon can holds 25 per cent less than the other can. By adding $\frac{1}{4}$ of the contents of this small 3-ounce bottle of Eccolene it will give the same or even more mileage.

"SIMPL-EZY"

TRADE MARK
GALVANIZED PRESSURE
PUMP

A GALVANIZED FORCE
PUMP WITH THE AD-
VANTAGES OF AN EX-
PENSIVE BRASS
PUMP.

For
Boatmen
Fishermen
Contractors
Plumbers
and
many
others.



Made in the
following sizes:

Size	Capacity	Price
1 1/2" x 24"	2 Qts.	\$2.75 ea.
2" x 24"	3 Qts.	3.50 ea.
1 1/2" x 36"	4 Qts.	3.90 ea.
3" x 24 1/2"	4 1/2 Qts.	3.25 ea.
2" x 36"	8 Qts.	3.50 ea.
3" x 36"	9 Qts.	3.75 ea.

Satisfaction Guaranteed

The "SIMPL-EZY" Pump is indispensable where the transfer of liquids is necessary. Made from Heavy Gauge Galvanized Iron. Has a tapered spout for hose attachment and four times the capacity of the ordinary pump.

One operation will convince you of its merit.

Your Dealer or

BURROUGHS TOOL CO., Inc.
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Berling Magneto

WORTH MORE DOES MORE

BUILD YOUR OWN BOAT

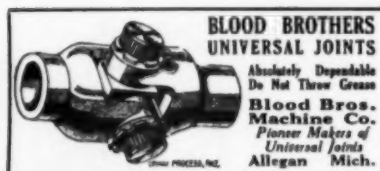


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DEFOR BOAT & MOTOR WORKS

—Cruiser, work boat, open launch or row-boat—from our knock-down frames or patterns. Save 1/2 to 1/3 the cost. Catalog on request.

Day City, Mich.



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Absolutely Dependable
Do Not Throw Grease
Blood Bros.
Machine Co.
Pioneer Makers of
Universal Joints
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Brooklyn Varnish Mfg. Co.

Waterproof Spar Varnish

For all OUT-
SIDE AND IN-
SIDE work. De-
fies Salt Water.
Guaranteed.

Brooklyn, N. Y.

Carl Fischer Offers Valuable Trophy for Displacement Boats

(Continued from page 35)

line. Positions will be determined by the owners or their representatives drawing lots previous to the start of each race of the match.

The winner of the match is to be determined by the point system, under which plan each boat entering and finishing a race of a match receives one point for entry and one additional point for each boat which she defeats, the winner being the boat scoring the highest aggregate number of points in all of the races of the match. In computing point the maximum number of entrants is to be deemed racing each day and those that do not start are to be counted as defeated boats. A boat which starts in a race, but does not finish before one hour after sunset, is to receive no points for that race and is to be counted as a defeated boat in that race by the boats finishing. In the event that two or more boats score the same number of points for the series, establishing a tie, the match is to be awarded to that one of the tied boats which has covered the course in the best total elapsed time for three races.

Each club whose challenge has been accepted is permitted to name its representative boat or boats and is to file with the challenged club and the Racing Commission of the Association, at least ten days before the date set for the first race, a certificate of the measurer of the club of the measurement of its boats. Clubs are restricted from entering more than three boats for the match. No boat is to be eligible to compete for the trophy which has since the year 1916 raced for a cash prize, or which has competed in, or has been entered in any race where a cash prize was offered, or which at any time since 1916 has been entered in a race by a person who is not an amateur under the meaning of the American Power-Boat Association racing rules. Measurements of boats must be verified prior to the match by the measurer or assistant measurer of the Association who is acting on the Race Committee.

In order to comply with the conditions respecting stock motors the owner must file an affidavit sworn to by the engine manufacturer stating that the motor is a regular stock marine model and not a "special" in any particular. Boats are to race without handicaps or time allowance. Competing boats must be fitted with at least three transverse bulkheads and have the motor compartment entirely closed in. There must be no break in the longitudinal continuity of the immersed surface of the hulls of competing boats, not more than one lifting surface and must conform to the committee's ideas of what is generally classed as a displacement type. Rudders known as bow rudders are prohibited.

The Race Committee is to fix and decide all the terms and conditions of the match, not inconsistent with the terms under which Mr. Fisher donated the trophy, by mutual consent, whether relating to dates, courses, notices, or other matters, except

(Continued on page 100)

Advertising Index will be found on page 112

The Standard Reverse Gear

is now giving supreme satisfaction on more than 30,000 motor boats, large and small. It is a strong, quiet, clean, trouble-proof gear that runs in oil, takes little space and lasts as long as the boat itself.

New Catalogue and prices on application.

Langtry Machine
& Tool Co.

706 Commercial
Avenue
DETROIT, MICH.



4 Sizes
1 to 15 H.P.
per 150
R.P.M.



Nautical Instruments

underlighted Compasses,
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Finders. Every navigator
should have them. Send for
interesting catalogue. Ad-
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Marine Compass Company
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We make them for the leading builders of marine, airplane and automobile motors. We are Integral Camshaft Specialists, insuring the utmost in quality of workmanship and materials, accuracy and uniformity.

Let us quote on your designs.

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The ideal clock for every motor boat, cruiser and yacht. The Radium Dial makes the hands and numerals visible at night.

Adopted by the U. S. Navy for Airplanes.
Price \$15.00. Other clocks from \$2.50 to \$6.00.

Write for details and prices.

Keyless Auto Clock Co., 246 West 59th St.,
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"Airdrive" Model L-3 3 H.P. for
canoes, rowboats, fishing
and hunting boats.
Model M-3 10 H.P. for light
commercial use, and pleasure boats.
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up to 50 ton capacity.
An "Airdrive" on your boat will
decrease your power troubles, give
you more satisfaction, and at low
operating expense. Let one prove
it for you on your boat.
KEMP MACHINE WORKS
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REVERSE GEARS

RADIATE SATISFACTION
Five Models Write for Prices
GIES GEAR COMPANY
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Get the details of our 18-foot V Special 2 1/2
H. P. ready to run. Price \$250. Plans of
other sizes on request.

Rider & Suydam

353 West 37th Street

New York, N. Y.



"The Motor That Crossed the Atlantic"

"Four Times Around the World—and Then Some Total Repairs \$46.80"—Captain James Stoddart

101,462 Miles

Record of Performance of Model L. Scripps Motor
Owned by James Stoddart, of Suquamish, Wash.,
as Taken from the Accurately Kept Log of the
Boat "J. S."

Round Trips	No. of Trips	Miles each Trip	Total
Regular ferry trips	5947	5	25235
Suquamish to Seattle	131	33	4323
" " Ballard	314	22	6908
" " Bremerton	27	36	972
" " Port Orchard	42	40	1680
" " Charleston	10	35	350
" " Tracton	7	46	322
" " Chico	11	48	528
" " Silverdale	4	52	208
" " Crystal Springs	3	38	114
" " Ilabes	5	28	140
" " Fletchers Bay	15	24	360
" " Brownsville	22	20	440
" " Manzanilla	8	12	96
" " Seabold	17	8	136
" " Keyport	21	14	294
" " Lemolo	2	14	28
" " Pearson	14	16	224
" " Skandia	7	17	119
" " Poulsbo	70	20	1400
" " Schuermans	2	21	42
" " Peters Spit	8	8	64
" " Harber	5	40	200
" " Culby	3	38	114
" " Manchester	1	36	36
" " Pleasant Beach	4	32	128
" " Long Branch	4	120	480
" " Stillacom	2	100	200
" " Tacoma	7	70	490
" " Olalla	9	60	540
" " Lincoln Beach	4	40	160
" " Saltray	2	18	36
" " West Seattle	9	34	306
" " Manitou Beach	5	15	75
" " Eagle Harbor	14	20	280
" " Port Blakeley	11	25	275
" " Port Madison	107	8	856
" " West Point	3	18	54
" " Jefferson Head	27	10	270
" " Marsh	41	8	328
" " Pres. Point	8	14	112
" " Kingston	31	18	558
" " Indianola	419	6	2514
" " Head Millers Bay	185	2	370
" " Nor. Point	5	20	100
" " Point no Point	7	28	196
" " Port Ludlow	11	50	550
" " Port Gamble	7	60	420
" " Port Townsend	9	65	585
" " Port Crescent	3	75	225
" " Dungeness	3	100	300
" " Tulalip	11	60	660
" " Everett	4	50	200
" " Mukitsee	3	35	105
" " Edmonds	17	25	425
" " Richmond Beach	23	20	460
" " Uleess Bay	2	40	80
" " Trips with salesman	155	35	5425

1358 hours towing of all kinds at average speed
which boat makes (8 miles per hour), this would
be equivalent to 13950 miles..... 13950

Total recorded miles..... 76462

Innumerable short trips made in this time were not entered
in log, and no account of same taken in above.

Total cost of repairs to engine since its installation up to
date (September 20, 1915, to March 8, 1918)—\$36.80.

The bulk of this repair cost came within the last month,
when new bushings were put in pistons and the motor given her
first and only general overhauling. Main bearings and connect-
ing rod bearings have never been renewed, and motor today is
in PERFECT MECHANICAL CONDITION.

(Signed) J. Stoddart.
Note: This boat has since made over 25,000 additional
miles without additional repairs of over \$10.00.

THE above is the mileage record of the
motor boat "J. S.," owned by Captain
James Stoddart, from date of installation,
September 20, 1915, to March 8, 1919. Every
mile traveled was in commercial service and the
total outlay for repairs was \$46.80. The bulk
of this came during the last season when, after
three years' run, the engine was given its first
and only general overhauling. Main bearings
and connecting rod bearings have never been
renewed and the motor is today in perfect
mechanical condition.

And this is only typical SCRIPPS per-
formance—a record made by one of our earlier
models. The new up-to-date SCRIPPS is not
only infinitely stronger and better, but is mod-
ernized to the minute. Nothing finer, more
complete or more up-to-date in a marine power
plant can be had.

Compare SCRIPPS results, which show real
motor performance, with any other motor built,
either commercial or pleasure.

Contrast SCRIPPS dependability with the
eccentric motor antics developed in modern
hydroplane racing—with its hit-and-miss starts,
its demand for fair weather and calm waters,
its petted and pampered temperamental power
plants.

Be motor-wise and enjoy motor boating to
the fullest with a SCRIPPS.

You are free from any and all worries through
the knowledge that everything is right—that
nothing will go wrong, just as Day knew that
his SCRIPPS would not fail him on his 6500
mile grind across the Atlantic, or Larsen in the
Whirlpool Rapids, or Bonnel and Nutting dur-
ing their 1000-mile ocean run through the fogs
of Fundy.

The SCRIPPS gives you the last word in
motor ease; freedom from noise, vibration or
mussiness about the boat. Its mechanical oper-
ation is letter-perfect. 10 to 75 H. P., gasoline
or kerosene.

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631 Lincoln Ave., Detroit, Michigan, U. S. A.

"Every Moving Part Enclosed"

CUT PRICE CATALOGUE SENT FREE



Any—and Everything
for a Motor Boat
E. J. WILLIS CO.
85 Chambers Street, New York

GULOWSEN "GREI" OIL ENGINE

Consumes 1/2 pt. of crude oil or less per H.P. per hour. Heavy duty. No carburetor or valves. Started in 30 seconds. Sizes 4 to 360 B. H. P.

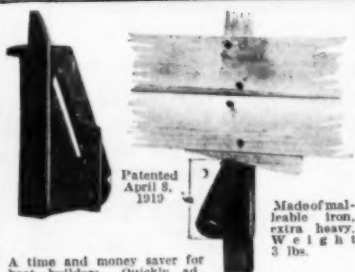
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Gulowsen Sales Corp., 17 State St., New York

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Used on the finest boats. Regularly supplied by highest grade boat builders. Wicker-Kraft Chairs, fitted with life belts, are an original Wicker-Kraft idea.

Write for illustrated catalog.
WICKER-KRAFT CO., Newburgh, N. Y.

CHUTE'S PLANKING & DECKING CLAMP



A time and money saver for boat builders. Quickly adjusted for timbers one to two inches inclusive. No chains or screws. Teeth only 1/16" deep, take a firm hold on the plank without marring the surface. Can be used up or down, and at turn of bilge.

Price \$3.00 each. 10% discount on one doz. or more.
Sent on approval upon receipt of price.

RICHARD B. CHUTE, Jr.
Boatbuilder Huntington, L. I., N. Y.

Take Taxes Off Motor Boats

(Continued from page 68)

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(Continued on page 94)

A New Sport—Model Motor Boating

(Continued from page 16)

gasoline motor of small size.

For those who are interested in model power boats, and have only a superficial knowledge of flash steam plants and their operation, a few words in explanation may not come amiss. Reference is made to the drawing, which gives the complete outline and arrangement of a flash steam plant. The operation of the gasoline torch is well known to most of us, and very few words will be said about it. The burner is provided with a vaporizing coil, which must be heated before the torch is lit. This vaporizes the gasoline and establishes a pressure forcing gasoline vapor out of the nipple, which is an orifice from eighteen- to twenty-thousandths of an inch. The gasoline torch blows its flame into the center of the boiler coils, keeping them red hot. A small water pump (E) is geared to the engine, and this forces water from the tank (G) through the boiler coils. Upon reaching the hot boiler coils, the water immediately flashes into steam, and by the time it has reached the opposite end of the boiler coils it is highly superheated, and enters the steam chest of the engine not as steam, but as a highly heated, dry gas under a considerable pressure. A check valve (K) prevents back pressure, and a relief cock (L) is provided in the system to relieve the pressure at a moment. The water tank (G) is kept full by means of a water scoop (J), which lifts water into the tank through the forward motion of the boat. An overflow is thrown over the side of the boat to prevent it from being flooded. Upon starting the engine it is necessary to use a hand starting pump, as the power pump is motionless. When the system starts the operation of the hand starting pump is cut off by the valve (H). Oil is supplied from the tank (M) by means of the oil pump, which is also geared to the engine. The oil is forced into the steam chest immediately before it enters the engine. The fast-moving steam sucks a sufficient quantity of lubricating oil with it to supply the engine.

Flash steam plants are very erratic in their action and require great patience and skill to adjust them. Any fluctuation of the blow torch which causes a lowering in its heat value immediately floods the engine, and a failure of the water pump through being fouled by tiny particles of foreign matter causes the steam to reach such a high value of superheat that it plays havoc with the engine.

Advertising Index will be found on page 112

What the Stop-Watch tells

THE performance of your motor depends greatly upon the sort of lubricating oil you are using.

Some oils deposit more carbon than others, but the amount deposited matters not so much as the amount that sticks to the cylinders.

Paraffine in an oil has a tendency to form a sticky gum in the combustion chamber which collects the free carbon. The heat of the engine hardens the carbon thus collected, preventing its escape through the exhaust. With no paraffine there is less carbon retained.

Southern oils of asphalt base contain no paraffine, consequently more of the free carbon is blown out with the exhaust.

SUPREME AUTO OIL is manufactured from asphalt base crude and *leaves less carbon*, at the same time giving perfect lubrication.

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AND SUPREME AUTO OIL


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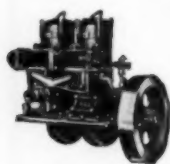
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Stands For
Simplicity, Dependability
and Economy

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SENSIBLE Safety Suit

The only ventilated and sanitary safety suit.
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for circulating purposes
are the very best. Hun-
dreds of Thousands in
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233 Pleasant St. Beloit, Wis.

40 H.P. Valve-in-Head Knox

(Continued from page 33)

The clutch is a standard make modified to a slight extent to adapt it to the high pressure lubricating system and thus assure that it is at all times properly lubricated. It is mounted on an extension of the engine base thus assuring perfect alignment while the oil-tight housing with unusually large hand hole keeps the oil in the gear and not in the bilge.

With the two-unit electric starting and lighting system it makes an ideal medium-duty unit power plant for a cruiser or light commercial boat. There are two ignition systems installed, each with its own set of spark plugs. A battery and distributor system for starting and a high tension magneto when running at speed. All high tension wiring is run through tubing thus keeping them out of the way and not covering the motor with a mass of loose and dangling wires so often seen on marine motors.

The Standardized Universal Motor

(Continued from page 33)

ring the piston is cut away or chamfered so that on the down stroke the superfluous oil on the cylinder wall is collected under the ring and returned to the base through small holes drilled through the piston wall.

The two halves of the flange coupling for the Atwater-Kent distributor are not bolted up tight but are connected by a stud which fits loosely in one half and is bolted fast in one of a series of holes in the other half which allows for adjusting the timing by changing the stud from one hole to another.

Although the crankcase is provided with as large hand holes as possible, the lower half can be removed without disturbing the main bearings which allows ample working space for adjusting the main and crankpin bearings.

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Five sizes—Single cylinder 3½ H.P., 4 H.P., 7 H.P. Two cylinder 7 H.P., 8 H.P.

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"America's Standard 4-Cylinder Engine"

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Kermath Engines Are Built for Exacting Boat Men

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If you require a power plant that is dependable under any and all conditions you will be satisfied with nothing but the Kermath engine. It is built for the man who considers *price last and quality first*. The reputation enjoyed by the Kermath is not because of its price. This reputation is based solely on its record of performances, a record attained by no other motor on the market.

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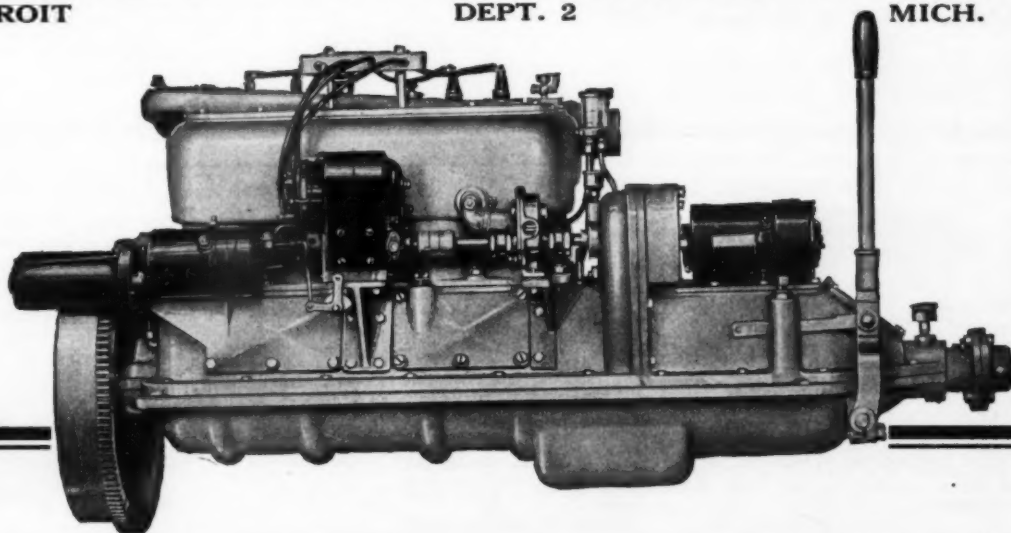
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The peculiar requirements necessary to the successful powering of the commercial boat makes the Kermath a wise investment for those who use a boat in business. Dependability in the commercial engine is of even greater importance than in the pleasure craft. Delays due to engine trouble are an inconvenience in a pastime; they are absolutely fatal in business. Power your work boat with a Kermath.

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Boating Practical
Handbooks:

Price, \$1.25 per Volume
\$6.00 per Set of Six Volumes

*See complete table of contents
of the Handbooks on page 98.*

Philadelphia, April, 12th., 1919.

Mr. Charles F. Chapman,
Editor.

Dear Sir:—

Enclosed you will find sixteen cents in stamps which was the cost of sending Practical Motor Boating Books to me. I am very well pleased with my set of books and I think anyone who is interested in this line of work should have a set. They contain more information about this line of work than any other books I have read on the same subject. Also every subject in the books is clear and understandable.

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**Improved
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1404

Dimensions: 18
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2½" cylinder.
For above or
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Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

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Height, 19 in.
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Depth Closed,
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Quartered Oak
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Lining and Fixtures
Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.

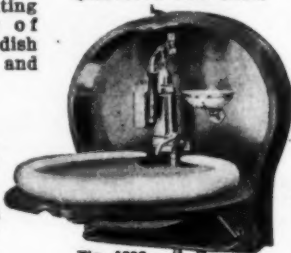


Fig. 1393 H H

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MARINE MOTORS
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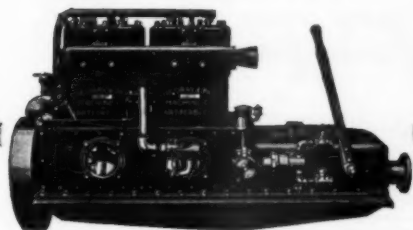
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36 Horse Power Bore, 4½ inches Stroke, 8 inches

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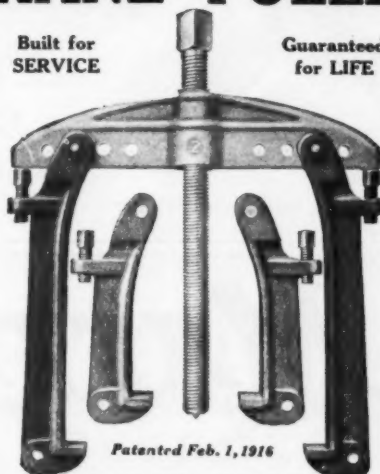
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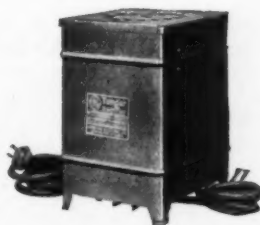
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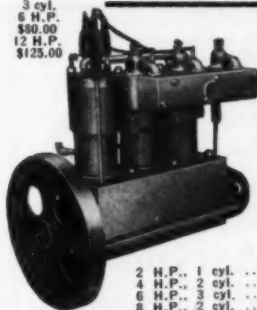
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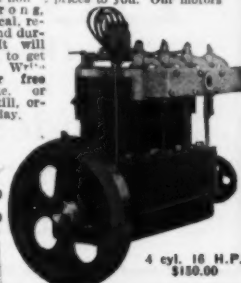
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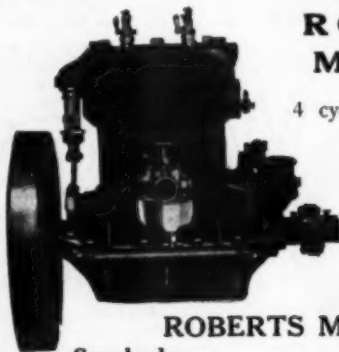
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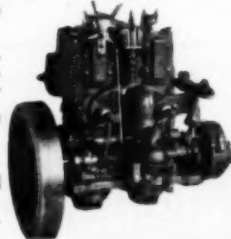
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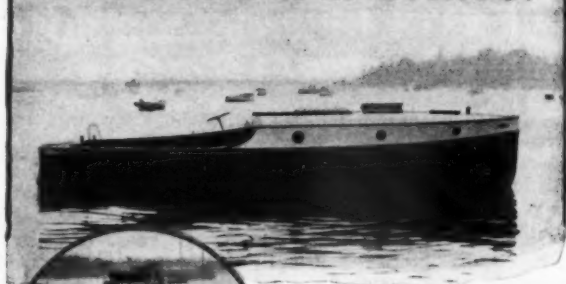
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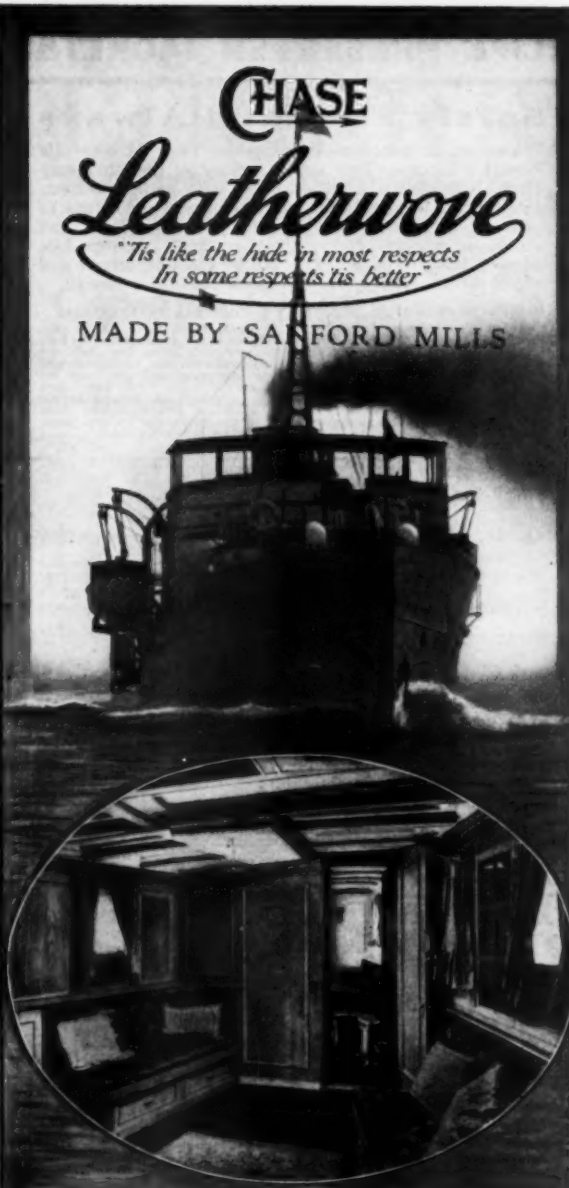
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CHASE LEATHERWOVE meets every requirement as an upholstery for boats — especially durable (often outlasts the boat itself) — economical — rich appearing — sanitary — easily cleansed.

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NEW YORK DETROIT SAN FRANCISCO CHICAGO
Leaders in Manufacturing Since 1847

Detectives of the Deep

(Continued from page 11)

craft was very close. Suddenly the water began to slap the bottom of the middle chaser and she began rocking gently, and at this moment the observer reported that his bearing on the submarine had changed from 180 degrees to 3 degrees which was under her bows. The submerged U-boat had passed directly under the center chaser. All three chasers were immediately gotten underway and an attack was made. After all of the depth charges had been dropped, the ships were stopped and observations again taken.

A propeller was heard to start up and run for about 30 seconds; and then a crunching noise was heard. It was quite certain that the Hun, having been put out of control, sank to the bottom and collapsed, due to the tremendous pressure. The chasers went back to the spot the next morning and found an oil slick two miles long by 800 yards wide on the surface of the water.

A peculiar incident in the use of the detectors occurred one early morning in the Mediterranean near the entrance to the Adriatic Sea. An enemy submarine had been caught in a net. A pattern of depth charges was laid around her and the trawler backed away to take observation. One of the listeners felt a heavy object brush against the detector. A few minutes later he was dumbfounded to see a German sailor climb on board. He had evidently been thrown into the sea by the force of the explosion and saved himself by grasping the detector as he drifted through the water.

Perhaps the most dramatic incident of the whole use of the detectors occurred on the morning of September 6, 1918. The account of the engagement as furnished to the General Electric Company says:

"At 1:25 o'clock Unit No. 6 fixed (located by triangulation) a submarine directly ahead at a distance of 100 yards. Immediately carried out a barrage 3-boat attack, each boat letting go three stern charges and Y gun. A pattern was laid symmetrically thoroughly covering any possible maneuver of the submarine. The ships then stopped and listened. Nothing was heard for about twenty minutes. Then they got contact. There was a distinct sound of the submarine making a noise as though the shafts were badly bent. It was also giving out a squeaking sound. The U-boat sounded as though it was having great difficulty in keeping the propeller going. She stopped frequently. Then came sounds of hammering as though repairs were being attempted; more squeaking, straining, running intermittently and apparently with great difficulty and for short periods.

"The second depth charge in this attack had thrown into the air for 50 or 60 feet a black cylindrical object about the size of a depth charge. Another depth charge attack was now carried out. The submarine had gradually been making shorter turns for some time. From this time on it is believed that the submersible bottomed and was never able to move except to start and scrape along the bottom a short distance. Noises indicated this.

"Subsequent events show that the submarine never moved from this spot. Noises indicated repair, with occasional unsuccessful attempts to start the motor, these sounds rapidly becoming less frequent.

"When morning came the submarine chasers and the destroyer which had been sent to the assistance of the others already on the spot gathered near where the crippled submarine was resting on the bottom. Sounds of feverish activity within the submarine's hull were distinctly heard.

"Suddenly there was dead silence, then twenty-five revolver shots rang out, three, followed by twenty-two.

"Taking into consideration all circumstances and events," continues the report, "it was concluded that the submarine was damaged externally and unable to start her motor after repeated attempts. Unable to rise to the surface. The crew giving up in despair had either committed suicide or the officers had first killed all of their men and then killed themselves."

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A NECESSITY ON EVERY BOAT



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CAN'T
DROWN**

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Rental Plan for Ocean Voyagers

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Every essential for good service—economy, power and dependability—is built into them.

There are ten Miller models, medium and heavy duty types, from 4 to 50 H.P. They are all four-cycle engines of approved design and will give the most economical service you can buy, considering first cost, fuel consumption and maintenance expense.

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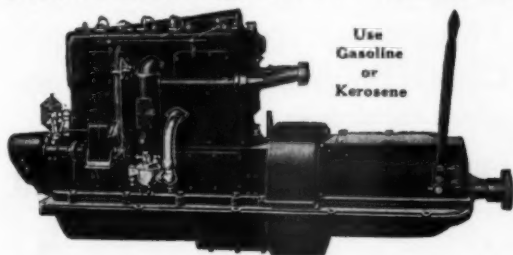
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A speedy cleanser that brightens up the metal work, whether hot or cold, and results in a lasting finish. Unexcelled for use on brass, nickel, tin, copper, zinc, or other metal parts of the boat. Put up in a variety of convenient sizes for the marine trade—1/4 pint, 1/2 pint, pint, quart, 1/2 gallon and gallon cans.

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—the pump that has never been known to fail even after years of service. It is accepted by wise boatmen because its operation is always the same—it renders supreme pump service. The discharge is governed by the speed of the motor so that it can be installed and then forgotten.

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Horsepower	16-18	24-26	32-35	50-60	20-25	30-35	45-50	75-80
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This glue will also attach canvas, cork, felt, rubber, leather and linoleum to iron, steel or wood. All the prominent builders of seaplanes used this glue in combination with cotton cloth between the veneer in diagonal planking. It is also used for covering hulls with canvas.

Special Marine Canoe Glue. Best Filler for Canvas, Black, White and Yellow.

Our 35c emergency cans made a big hit. Every canoeist should carry one; it is as valuable to him as a repair kit to a bicyclist or an automobilist.

Sent by mail on receipt of 40 cents in stamps. Canada 47c.

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All put up in 1, 2, 3 and 5-lb. cans; also 14, 28, 56, 112-lb. boxes, either tin or wood.

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But be sure to use the *best glue*—Jeffery's—the choice of discriminating boatmen the world over. Jeffery's is the standard—its record has been established on a real make-good basis.

Your dealer should be able to supply you with Jeffery's Marine Glue—if he has not got it in stock he will get it for you. Get in touch with him now.

"Marine Glue, What to Use and How to Use It" and "How to Make Your Boat Leakproof" are two valuable books that will be sent to you on request. Send for them to-day.

L. W. Ferdinand & Co.

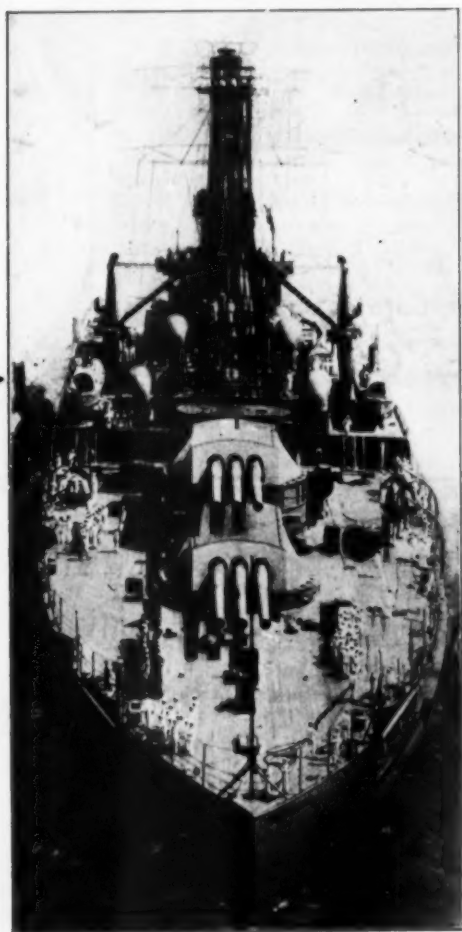
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The most compact and efficient marine power plant built. Full steam pressure raised in a few minutes.

Write today for bulletin "B"

Talbot Engineering Corporation
66 Broadway, New York City

Fruitful Foreign Fields

(Continued from page 14)

motors, was always hard to procure and there is no appreciable manufacture of steel in any of these countries at present.

The field for the motor manufacturer is better then, than it is for the boat builder proper for there are many native woods suitable for hull and superstructure construction and there are a certain number of skilled boat builders in all of these countries.

If American exporters are to do business in foreign countries, proper banking facilities are all important. And to the average American exporter proper facilities mean American facilities. He does not understand and has no patience with foreign banks and it is a source of great satisfaction to him to be able to do business with his own banks. In this respect the words of an official of the National City Bank of New York are interesting. Said he:

"American banking has extended into foreign fields. The American banks that have foreign branches are for the most part conducting American business through those branches in distinctively American ways. They get business and handle business after the methods of American banking as distinguished from foreign banking. We may have an American merchant marine which will develop distinctively American methods and organization, and make itself pay by doing so. One of the biggest things in American commerce is the disposition of American manufacturers who have highly-organized organizations of advertising, selling, and distribution at home, to extend their business abroad by the extension, direct of their American organization, as distinguished from relying on foreign merchandising organizations."

That is a thought to ponder over. Whether to market your goods through branch offices or agencies established in the countries in which you intend operating or whether just to send out salesmen from the main factory or nearest American branch, which in the case of Latin America would be New Orleans for most firms, or whether not to do any of these things but to sell your goods through native firms. There are advantages and disadvantages in all of these plans. In the use of representatives, traveling or permanent, from the main office, care must be exercised to select men who can speak the language. There have been instances of pathetic ignorance on the part of big firms who thought they knew what they were doing and who sent men into Brazil to sell goods whom they believed were well qualified for the work by experience and particularly because they could speak Spanish. And that in Brazil, where the commercial language is Portuguese and where next to that a salesman should be able to speak French.

Native agents have the advantage of being acquainted and the knowledge of the customs and demands of the country but their way of doing business is so completely at variance with our own that few manufacturers have the patience to train them. The proper mediums of advertising are extremely important and here expert advice is required. Circulation is not sufficient for exporters of marine products but they must be sure that the mediums used will bring their announcements before the class of people they are endeavoring to reach.

In exporting goods great care must be taken to comply with the regulations enforced by the various governments which differ considerably. For instance, each country has its own form of consular invoice used in making shipments to foreign countries. The regulations in connection with the preparation of such invoices are generally very strictly enforced; therefore, unless care is taken disastrous delays may ensue or the goods be refused admittance.

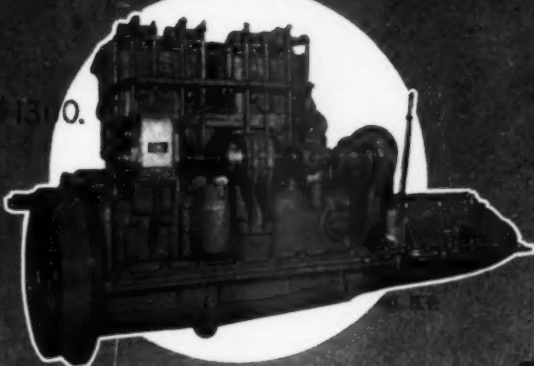
An ocean bill of lading is the most important of the shipper's papers. It is customarily drawn up by the shipper on forms which the carrier supplies, and which are signed by the latter after delivery of the dock receipt and the shipper's manifest. Besides being the final receipt from the carrier, the ocean bill of lading constitutes a shipping contract between the carrier and shipper. It becomes a negotiable document, and may be used by the shipper as the basis for a draft if it is drawn to his order. It is not the usual practice, however, for the ocean bill of lading to be drawn in the consignee's name unless he has a special agreement with the shipper, or unless advance payment has been made or security arranged before shipment. The basis of financial settlement most commonly employed in foreign trade is by drafts, or bills of exchange, to which have been attached a shipper's invoice, insurance

(Continued on page 100)

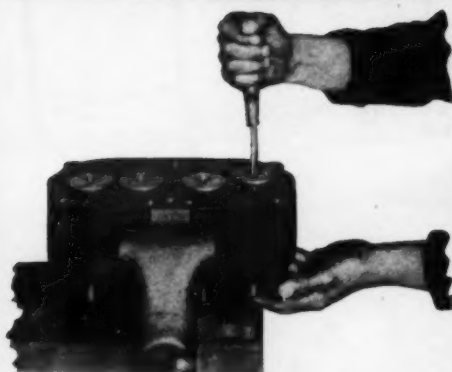


MOTORS

A better motor for cruisers, work boats and runabouts. A source of unfailing power, regardless of severe demands or adverse conditions.



KNOX MOTORS ASSOCIATES
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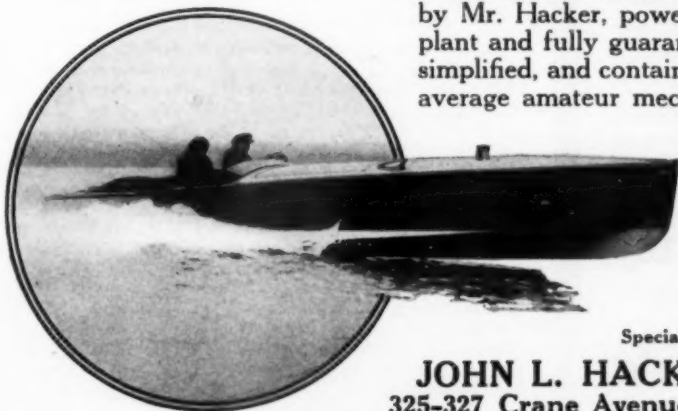


THE grinding of valves and scraping out carbon are, with the Knox Motor, very light tasks. Removing the cylinder head exposes the entire combustion chamber which, as all surfaces of it are machined, is quickly scraped out.

The cylinder head with its valves may be carried to any convenient place for the grinding operation. Both operations can be thoroughly performed in a minimum of time without the danger of getting any grinding compound into the cylinder bore and thus causing undue wear at that point. These are but further points of accessibility which are the striking feature in the Knox design.

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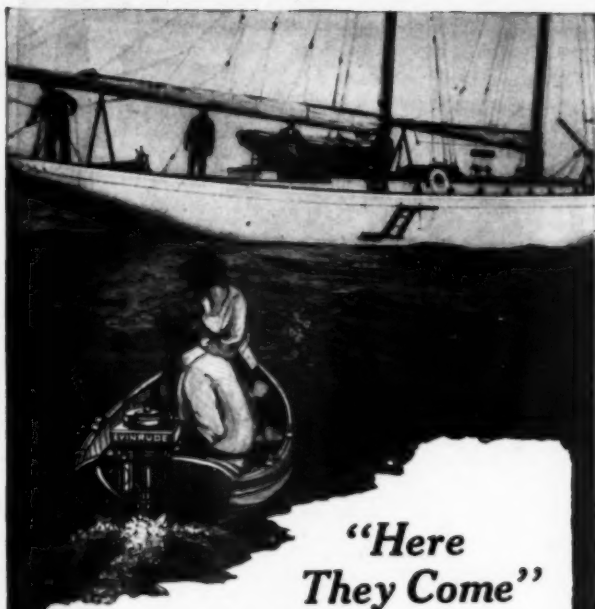


IF you are going to build your own boat, why not build it from Hacker up-to-the-minute Stock plans, which we are now offering you. John L. Hacker, N. A. America's foremost designer of Speedy and efficient V bottom boats, has just completed a number of new plans, based on boats which have been built, tested and proved by Mr. Hacker, powered with various standard power plant and fully guaranteed. These plans are especially simplified, and contain such detailed instruction that the average amateur mechanic will not find any difficulty in building a successful boat from them. Write for booklet, stating which boat you are interested in. The following plans are ready for delivery.

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It Was a Dinghy, Not a Dinky Cruise

(Continued from page 12)

in a sea way.

We arrived at Putneyville, a distance of twenty miles, at noon, after an uneventful and very enjoyable run, where we had our mid-day meal, after which our ever thoughtful commodore produced a large vacuum bottle of ice cream which sure did taste good, the day being hot.

Putneyville is a small sleepy town, composed chiefly of summer residences. It is situated between two points, on the east side of a little creek which is just deep enough to allow small boats to go up behind a small bluff for protection if necessary.

We started the second leg of our journey in a light squall off the southeast, which was just what we wanted as it gave us a good run to Sodus Bay, twelve miles distant, and we were anxious to get there that afternoon. The wind only lasted long enough to kick up a little sea and then died to a whisper which forced us to use the motors again and take on our tow, chugging along until about three o'clock when the breeze freshened and our tow yelled to be cast off. We then proceeded along under power and canvas and it was not long before the rest of the fleet were left in the distance. Arriving at Sodus Bay about 4 P. M., my bunkmate and I donned our bathing suits for a nice cool bath in the lake and a change of clothes which we completed before the rest of the fleet arrived, when all headed up the bay to the Sodus Bay Yacht Club.

Sodus Bay sets back of a long neck of land practically hidden from view on the lake side, until one gets up the channel and around the point where a wonderful sight greets the eye. The bay it seems is made up of many small creeks, the mouth of each working back a short distance, making many delightful nooks and corners to be explored. All around the north and west shore it is thickly settled with cottages, while beautiful foliage holds sway around the south and east side with every little distance a cottage.

After a very enjoyable dinner at the club, prepared by a dusky cook, there was the dance, always to be found in this busy little summer resort, and afterward sat around the big summer hotel until the wee small hours of the morning visiting with the fair sex, finally deciding we had better get some sleep as there was no telling what the morrow would bring.

The next morning we were up and in the bay for our morning plunge at seven, after which we devoured some wonderful bacon and eggs prepared by the dusky cook. About nine o'clock the Sodus boys started getting their larks out for a race. These boats are of the pumpkin seed type, used mostly in quiet waters, carrying about 170 square feet of canvas. A match race was arranged between the two classes to see how they compared. There was a regular dinghy breeze blowing down the bay, so being a participant in the race, also possessed of a little kind feeling toward my fellowman, I refuse to say how the race came out. The Sodus boys were becoming real interested in the little 12-footers after seeing them in action, and were anxious to try them out, so we swapped boats for another race, which resulted in our bunch getting trimmed.

By this time we were beginning to feel the pangs of hunger, so after a good wash and change of clothing we piled into the club dining room for some real Southern Pan Chicken, which I don't believe can be equalled this side of the Mason-Dixon Line. The bunch separated in the afternoon, each to his own pleasure, but the evening found us all assembled for a sail on the bay, which lasted long into the night, chatting with our guests and listening to the hum of the centerboard.

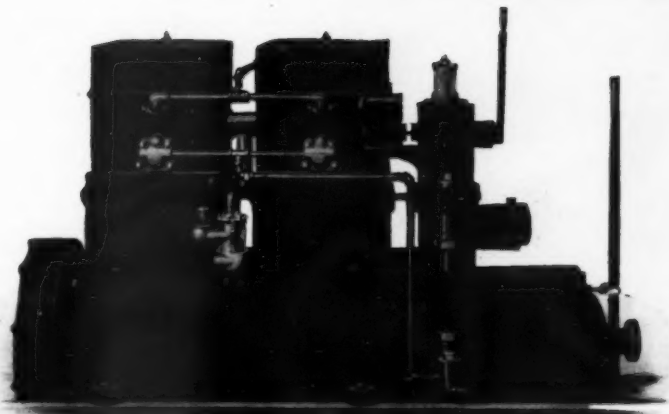
Monday we were up bright and early, stowing away our duffle aboard the little craft to continue our trip. A stiff southeast breeze was blowing so the commodore ordered two reefs tucked in and we got away at nine o'clock, heeled in the wind and making fast. With a good sea kicking up and a healthy old wind blowing, the temptation was too much for the vice-commodore and myself, so we piled the duffle and motor on one side, shook out the two reefs, and with two men on the rail we made Fairhaven, a distance of eighteen miles, in two

(Continued on page 90)



DELAWARE MARINE MOTOR

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4-Cylinder
4-Cycle
40-H.P.
750-R.P.M.
Valve in
Head
Equipment
Built In
◆◆



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Entirely
Enclosed
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MODEL D-F-IV—Port View

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DELAWARE MARINE MOTOR CO.
Commerce Street, Wilmington, Del.

Motors for All Kinds of Boats

No matter what type of boat you have or are going to get, if it doesn't require over 30 H.P., we have a motor to meet your requirements exactly. Our line is complete. The CAILLE



Caille
5-Speed
Motor

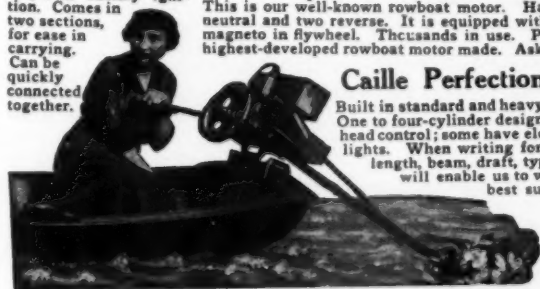
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Liberty Drive Rowboat Motor

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All complete, ready to run, with battery ignition. Comes in two sections, for ease in carrying. Can be quickly connected together.



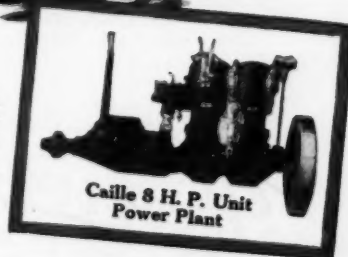
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Built in standard and heavy-duty types for pleasure and work boats. One to four-cylinder designs. Some have rear starters; some bulk-head control; some have electric starters and also furnish electric lights. When writing for inboard motor catalog, always state length, beam, draft, type and service required of boat. This will enable us to write you intelligently about the motor best suited to your needs.

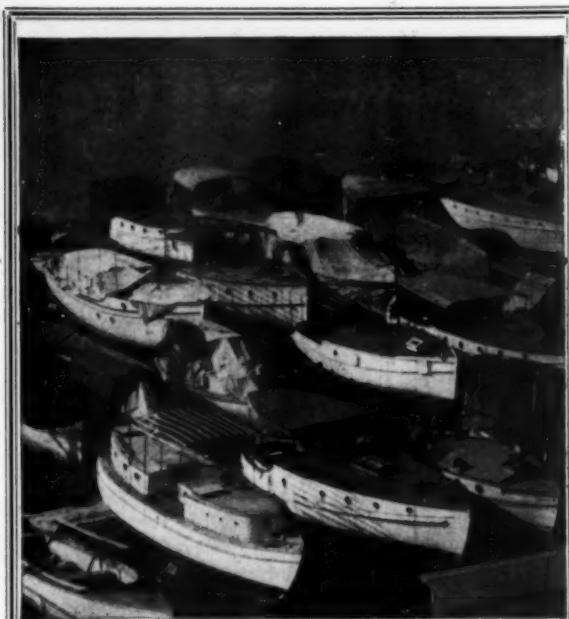
Caille Perfection Motor Co.

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Power Plant

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**Waterproofs
and Preserves Canvas**

It Was a Dinghy, Not a Dinky Cruise

(Continued from page 88)

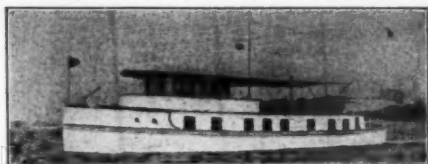
hours and ten minutes, which we consider fast time. Arriving at Fairhaven at 11.40 A. M., we selected our camping spot on a little point of land about thirty feet wide, connecting the mainland with the east pier. Fairhaven, or Little Sodus Bay, as it is rightfully called, is a rather long, narrow bay, very densely wooded on the west shore and thickly settled with cottages on the east. The south end has a little island connected by a rustic bridge, where if you stand looking down the bay at sunset you will see a picture no artist can paint.

By the time the rest landed we had camp well under way, and each man donated the grub he had aboard to make a meal, and for a makeshift it tasted mighty good. After dinner we all settled down to work, first building the mess tent, getting our covering up, which consisted of a line stretched between two trees and rubber blankets stretched over it. We then built the table and fireplace, where each man was to take his turn getting meals for the rest of the week, and we had some cooks in that gang.

Next morning we were up bright and early ready for anything. Starting with a good breakfast, after which the Vice and I went up the bay for supplies. Landing at Pleasant Beach Hotel, which is at the extreme end of the bay, we had a quarter of a mile to walk before getting into the town proper, which has about 600 inhabitants and is a typical country town, situated in a farming section. We made some very good friends during our stay, and certainly lived on the best the farms produced.

That night a Star boat from the Rochester Yacht Club pulled in to join our party, with four chaps aboard. They pitched their tent in a spot which looked snug and protected, but in the night a heavy northeaster sprang up and the sea washed them completely out. We found them the next morning on higher ground rolled up in their wet blankets, so dubbed them the Dirty Four, assuming that Mother Nature decided they needed a bath and gave it to them. The rest of the week was spent in just having a good, lazy old time, each man following his own inclinations, and after a few days of fishing, sailing, and swimming we were sorry to see the day of our departure draw near. We were scheduled to leave Friday morning, but a heavy northwester was piling the lake over the piers and we did not feel like bucking this all the way to Sodus Bay, so decided to wait until it abated. The storm lasted until Saturday night, dying out about midnight, so we set a man on watch to call the bunch as soon as the lake had quieted enough for us to travel. At 3 A. M. we were called and at four o'clock were under way in a morning so black we could not see the bow of the boat from the stern, so had to work through till daylight with the aid of a small compass and a lot of sailor instinct. The sea had died down to a long swell with a fresh southwest wind, which made the going pretty good until it had time to kick up a nasty cross sea, but we weathered it through to Putneyville, taking very little water considering the loads we were carrying. Arriving about ten o'clock, Capt. Delano said we walked like a bunch of foremast hands who had not been ashore for months as we filed up the narrow pier for our late breakfast.

We left Putneyville two hours later with the wind dying fast, so it was necessary to put the little motors on in order to make any time; but with the aid of the canvas at times when a breeze would spring up we made our next port, which was Nine Mile Point, by two o'clock. My bunkmate and I, feeling very much in need of a wash, shave and a change of clothes, undertook the job on this last leg by alternating at the helm, and it is still a question in my mind as to whether or not we improved the appearance of our faces any after trying to shave with a straight razor in the choppy sea which was running, for we sure did mess them up considerable. While at Nine Mile Point we loaded in a few refreshments, and after working off our sea legs started on the last lap of our cruise, arriving at our little pier at four o'clock, thus ending our 8-day cruise in a 12-foot dinghy.



70-ft. LANAI

built by us and sold in 1911 through Messrs. Tams, Lemoine & Crane to Ex-Com. A. C. James, of the New York Yacht Club. A boat that proved its sturdiness on its maiden trip south, despite ice floes and storms at sea.

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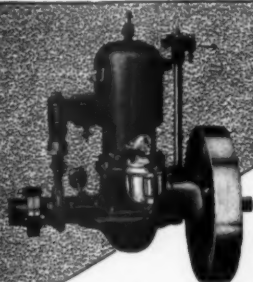
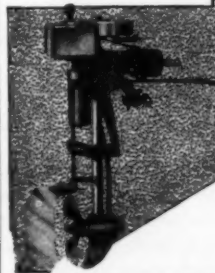
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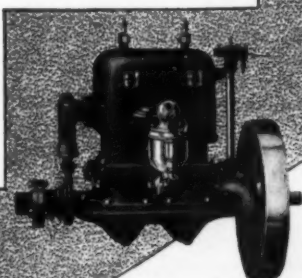
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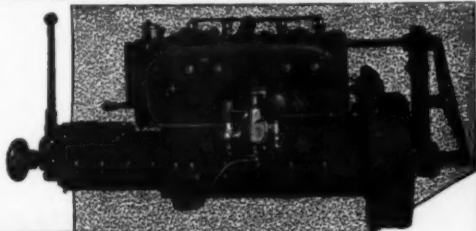


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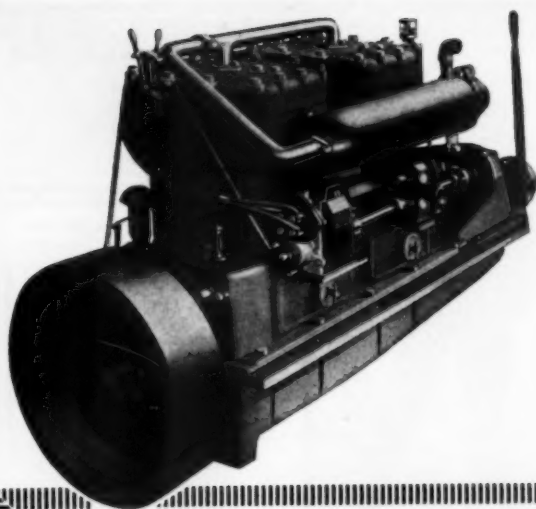
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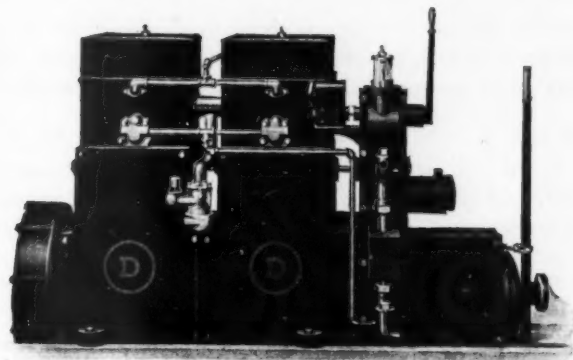
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Write today to your Senator or Representative in Congress at Washington and impress upon him the injustice of the tax rate on motor boats. Point out to him all the above reasons, and as many more that you know of. Have your yacht club take action.

THE JOHNSON MARINE REVERSE GEAR

In the No. 3 Model "F" Ball Bearing Type
in a special case design, as adopted on the new
Delaware Marine Motor

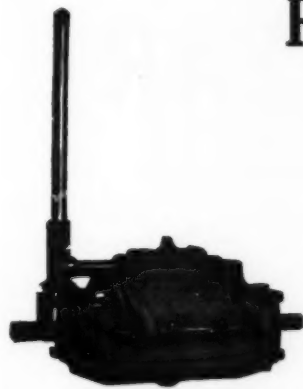


The Johnson is the Only Ball Bearing Reverse Gear Made

The use of ball bearings is an exclusive feature found only in the Johnson Marine Reverse Gear. And because of this feature it is selected by the majority of boat owners and engine builders.

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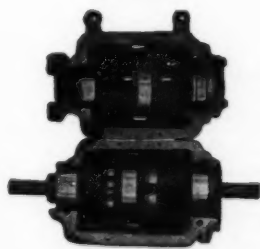
Nothing but the finest of material is used in the making of the Johnson Marine Reverse Gear and this is one of the reasons it is selected by such reliable builders as Evinrude, Frisbie, Koban, Lockwood-Ash and Sears Roebuck Company.



Exterior.



Interior.



Cover raised.

Make Your Boat Safe

You must have a good reverse gear if you want to keep the element of safety in boating as high as possible. If you will send us the size of your boat and engine we will suggest the proper gear for your use. Write to-day to department 25.

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YOU buy power to use—when you want it—and as much as you want. When landing a big load of fish at a crowded dock, for instance, you simply **must** have power that obeys the instant you throw the lever.

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Though built for every need, Joes Gears are especially suitable for heavy duty work, where the loads are heavy and the changes frequent. You can have Joes Gear on your new engine or on your present one. Engine manufacturers are perfectly willing to put it on if you specify it in time. Write us or any of our agents.

88 Per Cent. Reverse Ratio

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for

**HEAVY DUTY
WORK BOATS**

Send for Joes Catalog

It shows sizes and prices of Joes Gears for every boat—small, compact, high-power gears for medium and high speed motors, special racing gears, and one-way clutches for very high speed boats and hydroplanes; also big, Duplex Drive Gears for slow-running, heavy duty motors where a high speed ratio is imperative. Joes Catalog is free.

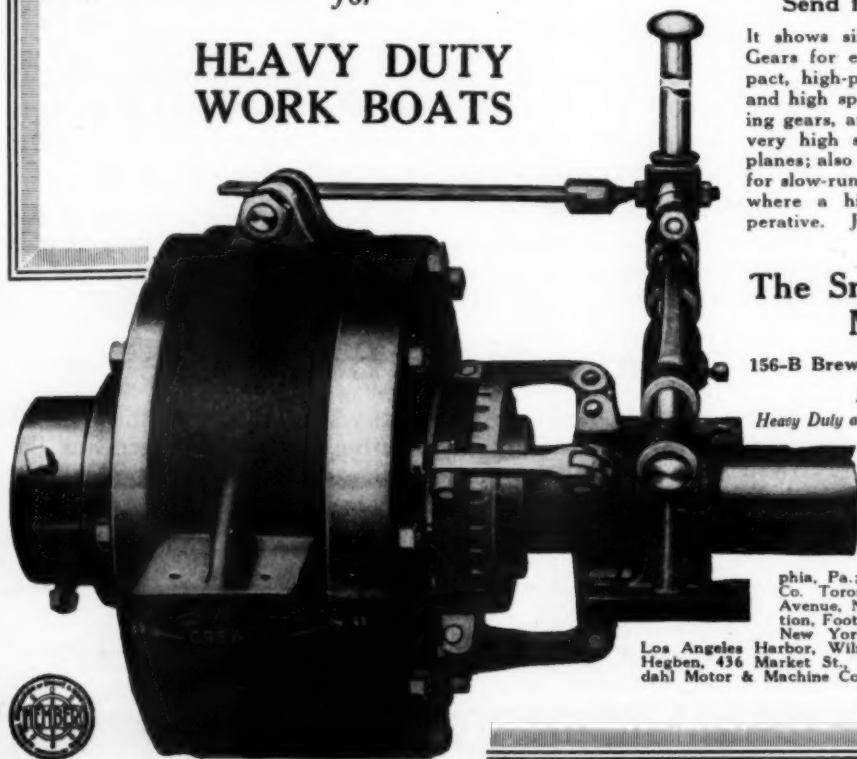
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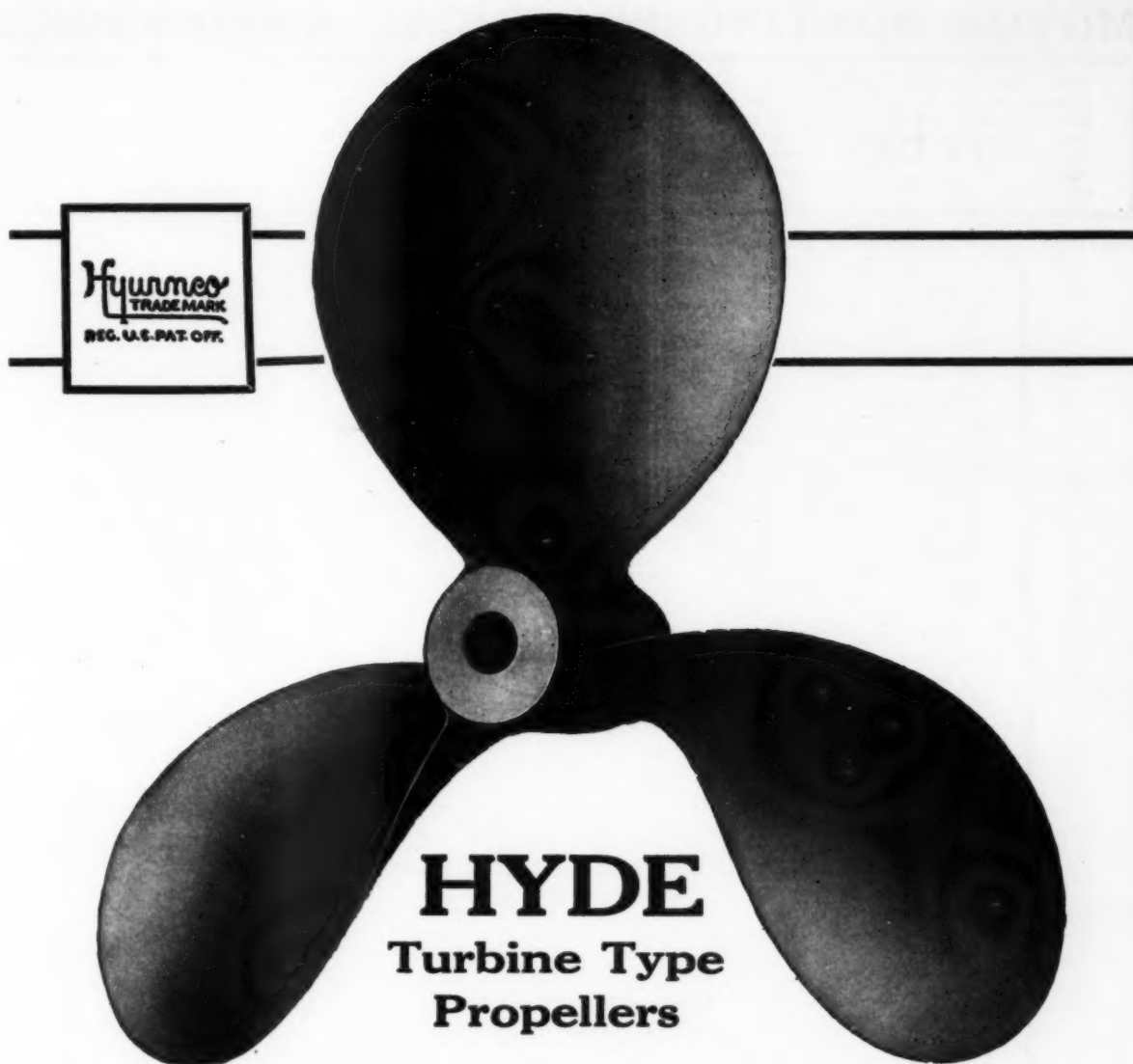
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Turbine Type Propellers

are designed to render full propeller efficiency on every type of hull. That they do produce maximum results is proven by the fact that the HYDE has for years dominated the propeller field throughout the country.

HYDE supremacy is well-founded, being based upon correct design, highest quality of material and superior workmanship.

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Catalog and data sheet upon request.

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MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR Boating believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR Boating, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom vs. Sharp Bilge; What are the Advantages of Flare? Raised Deck vs. Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The \$1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Borth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsuccessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed vs. Heavy Duty; Long Stroke vs. Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing a Motor in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers vs. Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking Care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbling a Worn Bearing; Should Fuel Line be Inside or Outside.

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

Practical Suggestions for Handling, Fitting Out and Caring for the Boat

Volume 6.—This volume is an especially valuable one. You will find in it points covering the care of your boat that you never dreamed of before. Whether you are a beginner or a finished expert this book will give you a better knowledge of the handling of your craft than you can imagine. List of contents: Putting the Boat into Commission; Fitting Out a Thirty-Footer; Suggestions for the Beginner; Refinishing Bright Work; Keeping the Wood Surface Bright; Putting the Boat Out of Commission; Laying Up an Unsheltered Boat; Hauling Out for the Winter; Covering the Boat for the Winter; Launching from a Wharf; Correcting Faults; Lengthening Out the Boat; Moorings and Buoys; Taking Steps to Safeguard the Anchor; What to Use in the Bilge; Preserving the Wood in Boats; Emergency Rigs for the Cruiser; Auxiliary Sails for the Cruiser; Providing an Emergency Rudder; Preparing for Southern Waters; Stopping the Troublesome Leak; Replacing a Broken Plank; Removing Broken Lag Screws; Raising the Boat's Stern; Clearing the Propeller; Protecting the Bow and Stern; Open Boat Sleeping Quarters; Ventilating the Cabin of Small Cruisers; Converting the Open Boat to a Cruiser; Making a Cover for the Open Boat; Preventing Electrolysis; Building a Club Float; A Floating Boathouse; Constructing a Landing Stage; Building the Marine; Keeping the Thief Out; A Place for Your Shore Clothes; Stowing for Life Preservers; The Winter's Alterations; What Changes Shall I Make; The Satisfactory Bilge Pump; The Pressure Water System; Making a Pelorus; Your Storm Curtains; Life-Saving Equipment; The Absent Owner's Anchor Light; Mounting the Reverse Gear.

Price \$1.25 per volume, or \$6 per set of six volumes of over 1,000 pages.

The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR Boating

119 West 40th Street, New York

Advertising Index will be found on page 112



The President's Barge

represents the last word in the motorboat construction. That this splendid boat is equipped with

PARAGON REVERSE GEARS

is but logical—the equipment throughout this boat naturally being the best obtainable.

Paragon Reverse Gears are furnished as standard equipment by the majority of the better type of marine engine builders. Be sure that your next power plant is Paragon-equip.

Paragon Gear Works
Taunton, Mass.

Sedan Runabout, tender to the President's Yacht, U. S. S. Mayflower. Length, 30 feet; beam 7 feet 4 1/2 inches. Power plant, Van Blerck 8-cylinder 200 H. P. Speed, 30 miles.

Designed and built by the Albany Boat Corporation



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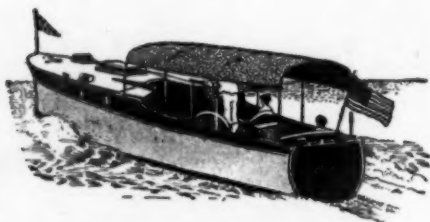
Spray Hoods

OUR Spray Hoods, Motor Boat Awnings and Boat Covers have been in demand ever since the introduction of Motor Boating. They add to the appearance and comfort of your boat and can be had in any color, weight or pattern.

If your boat is in the vicinity of New York, we will be glad to measure and give you an estimate; if at a distance just write for our diagram by which you can give measurements.

—Makers of—
"CURTINMADE"

SAILS	TARPAULINS
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Motor Boat Awnings

JOHN CURTIN CORP.

ESTABLISHED 1853

48 Front St., New York

Phone 6006 Broad Cables: NITRUCON

Advertising Index will be found on page 112

Fruitful Foreign Fields

(Continued from page 86)

policy, and ocean bill of lading. The number of copies of the bill of lading required, vary according to the nature of the transaction. Banks, if settlement is to be made by draft, will require two or more negotiable copies and the possession of all of the negotiable copies. Non-negotiable copies will also be needed by the shipper, the carrier, and the consignee for filing, and by foreign consuls to meet the provisions of the law.

An export bill of lading is used in cases where the exporter at an inland point wishes to bill his goods from point of shipment to foreign point of receipt, port or interior. By obtaining a through bill of lading from a railroad the exporter obviates the necessity of securing a railway bill of lading to the export port, and then an ocean bill of lading to the foreign port of receipt. The export bill of lading constitutes a triple contract, covering shipments by rail or water to the port of export; shipment by sea and shipment from the foreign port of entry to the inland destination.

A parcel receipt is issued by ocean carriers to expedite the transportation of small packages, most commonly samples, although practically all motor boat engine parts and accessories could be so shipped. The value, weight, and dimensions of the goods carried are restricted. Parcel shipments are designed to avoid the high rates that would have to be paid for small lots of goods under the minimum freight charge stipulated in ocean bills of lading, under which nothing less than a ton rate or a specified amount would be accepted, no matter how small the consignment. Numerous shipping lines are using these receipts.

The Hydroplane in War

(Continued from page 18)

fish but they were only the inevitable C. M. B.'s. (They were towed part of the distance so that they should have an abundance of gas left for any emergency.) Towards midnight they started their engines, slipped their towing cables and took up their position at the head of the circus. They had been fitted with all the latest smoke-producing apparatus, and on account of their diminutive size and great speed were sent on ahead to lay the preliminary smoke screen. Some carried great flares, which had to be dropped in the harbor entrance as a guide for the block ships. Others carried torpedoes to be fired against the piers with the object of blowing up certain gun replacements. A few were to stand by with their tin fish to deal with any enemy vessels should they become too bold and venture out. Others were equipped with stokes guns, their duty being to run along close to the mole and hurl shells over the top.

No need to enlarge upon what is now an old story. Each man did his part well—the venture was a splendid success, and so that chapter was closed. But the little scooters continued relentlessly their night watches—always looking for prey. And it was only the evacuation of the Belgian coast by the Huns that brought the work of the C.M.B.'s to an end—or at least until they could be transferred to other regions. But the signing of the armistice interfered before much was accomplished.

Before closing it is only fitting to remark on the latest C.M.B., which is 70 feet in length and is probably the world's largest hydroplane. With constant improvements in engine design and increases of power, we may reasonably expect still further developments along this line, but even as it is the hydroplane in war has proven a huge success.

Carl Fisher Offers Valuable Trophy

(Continued from page 70)

that the challenged club must immediately upon receipt and acceptance of the first challenge notify in writing the Racing Commission of the American Power-Boat Association of the fact, and transmit to it a copy of the challenge. The date for the first race of this match is not to be set for a day earlier than thirty days after the course and dates agreed upon.

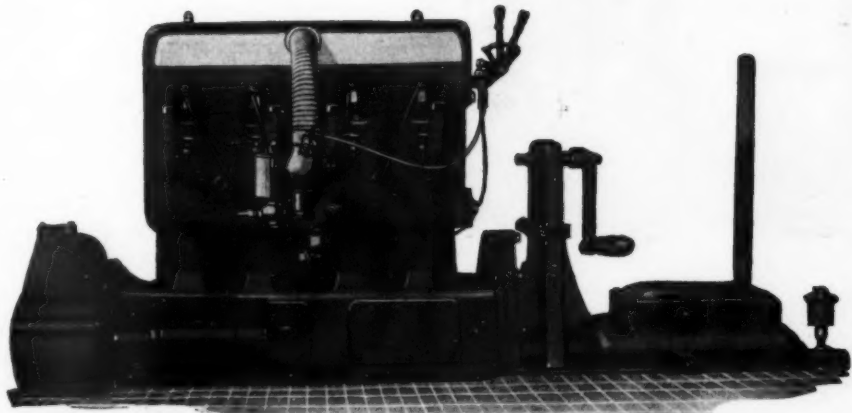
In the event that a club having custody of the trophy shall be dissolved or otherwise cease to exist, or resign from the Association, or refuse or fail to comply with all the terms and conditions of the Association, the trophy is to revert to the Association. The trophy is to be delivered to the Chairman of the Racing Commission one week prior to the date set for the first race. After the finish of the match the trophy is to be suitably engraved with the name of the club and boat winning it and the date.

New Gray Gasoline or Kerosene Motor

Gray
2 Cycle
Motors
Standard
the
World
Over
\$84
and
Upwards

Designed to use the prevailing low-grade fuel efficiently and satisfactorily.

A POWERFUL MOTOR of UNEQUALED QUALITY, and sold at a price possible because of LARGE production.



20 to 25 H. P. A Sturdy Motor with Power and Endurance for a Work Boat or small cruiser. Suitable for a 20 to 26 ft. V Bottom and speedy enough for a round bottom runabout up to 30 ft. Write Today for Catalog

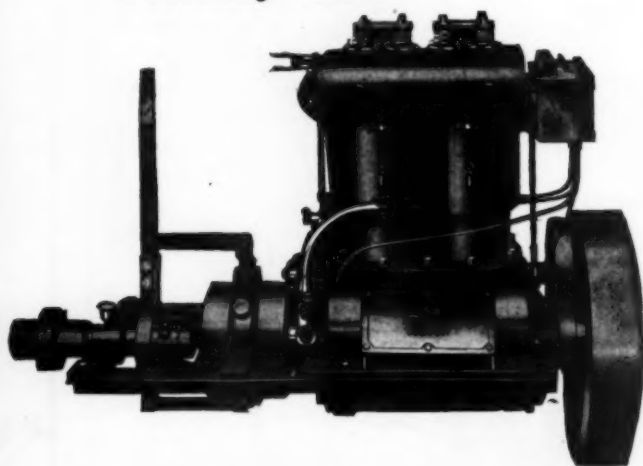
Force Feed Lubrication to Main Bearings - Bronze Back - Babbitt Lined Bearings thruout. Silent and Clean in Operation - Motor cannot back-fire thru carburetor and set fire to your boat.

Gray Motor Company, Detroit, Mich.



Frisbie
VALVE-IN-HEAD
MOTOR

*the
friendly motor*



**Send for Complete Literature
on Frisbie Medium-Duty Motors**

Frisbie Motors are made in these sizes: 1-cyl., 5 and 7 H.P.; 2-cyl., 10 and 16 H.P.; 3-cyl., 18 and 25 H.P.; 4-cyl., 30 and 40 H.P.; 6-cyl., 50 and 75 H.P. Bore and stroke, $4\frac{3}{4} \times 5$, and 6×6 . Then, there is the Frisbie kerosene Motor which is a brilliant success.

The Frisbie Motor Co.
7 College St., Middletown, Conn.

Frisbie an' I

—how we “sparked”
sweet IDA MAY!

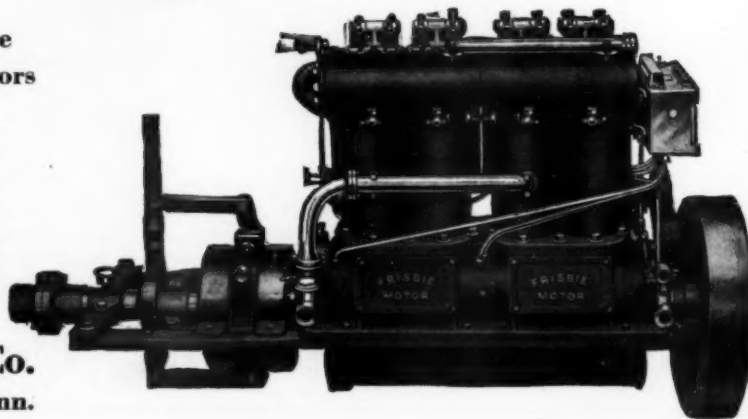
A WHILE ago, Ida fared forth with 35 gallons of gas in her tank and a 16 H.P. Frisbie motor in her hull. For 22 hours and 16 minutes her motor never stopped or missed fire—all due to a good, hot “spark,” and Frisbie construction.

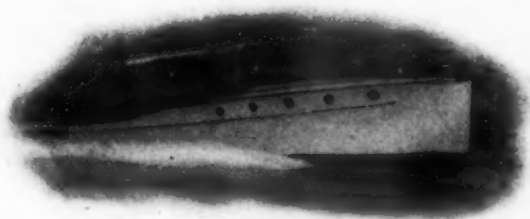
Mr. W. F. Farley, of Apalachicola, Fla., who owns the *Ida May*, says the complete run on the 35 gallons of gas consumed 27 hours and 23 minutes. He says it is the best motor he ever saw—and he has tried out a good many motors in his time.

The Frisbie Motor seems to be noted for its “longrunability.” It's no uncommon thing for a Frisbie-powered boat to run for days and days without stopping the motor, even though heavily laden and hampered by rough going.

And Frisbie owners speak lightly of their repair bills—generally in terms of cents, usually 50 or 75 cents a season!

The answer is: Good design and sincere construction. If you want a motor that goes on about its business, get a Frisbie!





For immediate delivery—

That is a big item just at this season of the year when warm days and the dancing blue of sparkling water stir the blood to boating's pleasures.

Every moment's delay right now is the loss of a golden opportunity for enjoyment—that is one reason why this desirable Albany Standardized 36-foot Cruiser, complete in every detail—ready for you to step aboard, cast off and sail away—should appeal.

Cabins are light and airy with ample headroom and good beam. A big, convenient galley with 3-hole stove and oven (isolated from engine room) permits the preparation of real home meals. A thoroughly sound, seaworthy boat combining the important Albany features, unusually speedy and comfortable for a boat of this size.

Just press the button and be on your way—

Idly, like a drifting leaf, or skimming the surface at top-notch speed.

Albany controls are so simple to operate and so conveniently located that real enjoyment and safety are added to the charm of boating.

This 30-foot fast Runabout is the result of long experience in building desirable boats and combines many features that will add to the comfort, pleasure and safety of its owner.

In considering the purchase of a pleasure craft, Albany Boats are worth investigating. Immediate delivery is possible if desired.

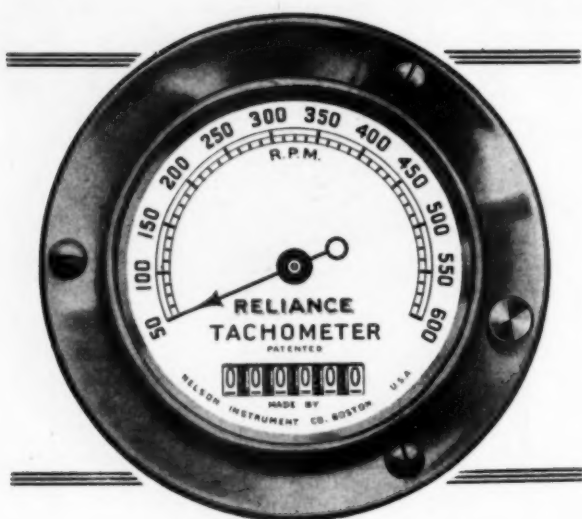


Albany Boat Corporation

7th Street, Watervliet, N. Y.

We do not issue a general catalogue, but compile bulletins, plans, specifications, etc., for each boat separately, giving maximum information. When you write please state which type and size of boat you are interested in.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating



Are You Sure Your Engine Is Delivering the Goods?

The goods that an engine should deliver are effective revolutions per minute. An engine at its best delivers for each unit of fuel consumed a maximum number of revolutions per minute consistent with propeller efficiency. There is just one carburetor adjustment, there is just one location of the spark lever, and there is just one best temperature for cooling water, which, under given weather conditions and with a given grade of fuel will give the most R.P.M. for a certain throttle opening. This means that adjustments are constantly called for in order to meet the varying weather conditions and grades of fuel. In order to make these adjustments intelligently and know whether the engine is profiting by the adjustments it is essential to have a dependable tachometer that will accurately indicate each change in engine speed.

The Reliance Tachometer

is a centrifugal instrument that is not influenced by magnetic or atmospheric conditions. It is constructed throughout in such a way that it will not get out of adjustment even after long and constant service—ONCE INSTALLED, ALWAYS IN COMMISSION. It gives an accurate reading because its design is mechanically and scientifically correct. Each instrument dial is individually calibrated, insuring a correct reading over the entire scale. Reliance Tachometers are built in various models, with and without counters, as explained in Bulletin 102, which will be mailed on request.

Nelson Instrument Company

7 Elkins Street

Boston, Mass.

Among the Clubs

Advocates Florida Canal to Connect Atlantic with Gulf

A 10-mile canal will furnish the connecting link between the Atlantic Ocean and the Gulf of Mexico, furnishing an all-water route through the Florida peninsula, according to Fred F. Smith, of the Petersburg, Fla., Yacht Club, who is taking active measures to work up sentiment in his city and state to have the canal built. Mr. Smith estimates that \$50,000 will be all that will be required to dig this canal, which will cut through low land with no natural obstacles in the way. With improvements to be made by the direction of Congress and with money appropriated by the Government on the St. Johns River and the Ocklawaha River and Lakes Griffin and Harris, and finally to the Withlacoochee River, Mr. Smith says that the canal will be all that will be necessary to connect these two important bodies of water.

It is believed that this waterway would prove attractive to the motor boat tourists who now visit the East Coast of Florida in the winter and who do not get around to St. Petersburg because a journey in the open sea for a part of the way is necessary. By this water route, using the rivers and lakes, the distance from Miami to St. Petersburg would be about 260 miles through a very picturesque region.

Summer Yachting in Florida

The belief that Florida is simply a winter State is an erroneous one, for outdoor diversions are just as popular in that State in the warm months, if the summer months can be so termed in a State where all of the months are comparatively warm, as they are when the Northern visitors are enjoying the balmy weather in mid-winter.

News from St. Petersburg, Fla., indicates that the motor boats and sailing craft are extremely active. The St. Petersburg Yacht Club has one of the finest and most commodious club buildings in the South, which its 200 members and their families make one of the social centers of the Sunshine City. Located in the heart of the city and the water front and park system, its beauty and convenience make it an ideal place for social life. For yachtsmen, motor boatmen and fishermen it affords a charming place for meeting and lounging.

Bayside's Log

The regular semi-annual meeting of the Bayside Yacht Club was held at the club on May 14.

Charles D. Poey enters a new boat this season. She is 28 feet over all, has a 5-foot beam and makes 18 m.p.h.

Roy Moody, who sold his power boat Sea Wolf III to the Government for war service, is building a new cruiser at the yard of George J. Stelz, in College Point.

Donald Cowl has purchased Shadow.

The Bee Class Vespa has been purchased by H. S. Gaines, who will race it in that class during this season.

Two members of the Bayside Yacht Club have been officially cited for bravery since the citation of Corp. Richard Walsh, of the Club, was given out. These are First Lieut. William S. Hawkins, of the 107th Infantry, and Capt. Claude G. Leland, of the same command. The citation for Captain, then Second Lieutenant, Leland states:

"For exceptional courage and qualities of leadership in battle near Vendhuile, France, Sept. 29, 1918, in promptly reorganizing his battalion with great initiative and firmness when his battalion commander was wounded and his own Captain and First Lieutenant killed.

Lieutenant Hawkins' citation states:

"For extraordinary heroism in action near St. Souplet, France, Oct. 17-18, 1918. Acting as liaison officer during the forcing of the La Selle River, Lieutenant Hawkins was severely wounded by an exploding shell. Undeterred by the weakened condition to which his wound reduced him, he bravely continued on, working untiringly under heavy shell and machine-gun fire for two days until the advance of his battalion was checked."

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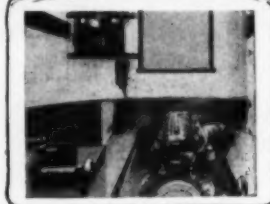
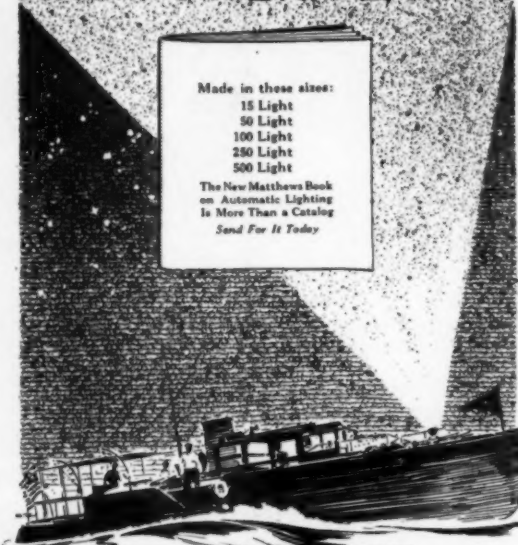
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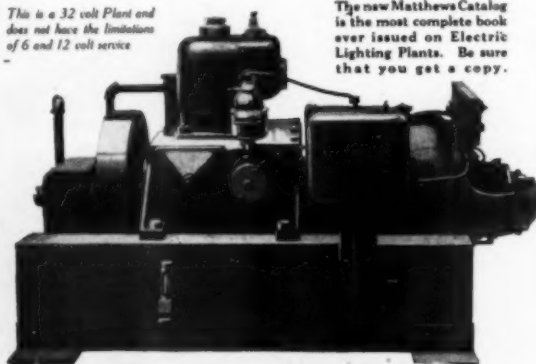
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Among the Clubs

Carondelet Comment

The Carondelet Motor Boat Club of St. Louis, Mo., has appointed a racing committee to arrange for speed boat races to be held in June and July. The committee sent out a letter to nearby clubs asking them to send a list of their various types of boats, so that the races could be properly arranged. If there are not enough speed boat entrants the committee plans to hold contests with boats of other types.

Sag Harbor Plans

The yachting season on the east end of Long Island promises to be popular now that all restrictions on the beautiful waters of Long Island Sound are removed. The various yacht clubs are making active preparations for the summer, both as regards the necessities of their own members and the need of taking proper care of visiting yachtsmen.

The Sag Harbor Yacht Club last summer made extensive repairs to the club dock, which had been previously injured by ice during the severe winter of 1917-18. Visiting yachts are sure of a cordial welcome; and any assistance needed may be obtained from the club steward as to repairs on engines, charging of storage batteries and the obtaining of supplies.

The Yacht Club is situated on an arm of Gardiner's Bay. The channel is well buoyed, and the club anchorage affords a quiet, clean and safe holding ground. It is well protected by a breakwater. A dock 300 feet long makes it easy for good size yachts to run directly to the clubhouse.

This Club has always made it a point to extend a very cordial welcome to visitors, and it is one of the favorite resorts of Connecticut and Rhode Island yachtsmen who spend week ends in these charming waters.

All needed supplies such as gasoline, oil, etc., are obtainable at the clubhouse; ice, groceries, and meats may be had from the village stores nearby. An invitation is extended to all yachts to use the Club property freely.

Rear-Commodore Dr. Charles Dwight Napier, who has been with the colors during the war period, will be with the Club during the summer. Dr. J. Richard Taylor, Vice-Commodore, is now putting in commission his yacht Netop. Other officers of the Club are W. S. Eaton, Commodore, and E. P. Eaton, Secretary. Any information regarding the waters of Gardiner's Bay and adjacent cruising grounds will be gladly furnished.

Midget Squadron Officers

At a recent meeting of the Midget Squadron of Jamaica Bay the following officers were elected for 1919:

Thomas McKee, Commodore; Edward L. Smith, Vice-Commodore; George E. Flohn, Secretary and Treasurer; James C. Crofts, Fleet Captain; Dr. Frank Miller, Fleet Surgeon; Thomas McKee, John Boehmer, Charles Anderson and William Wulff, Board of Directors.

Long Island Association Racing Dates

Racing dates decided upon by the Yacht Racing Association of Long Island include: Harlem Annual, May 30; Knickerbocker Annual, June 7; Orienta Annual, June 14; Larchmont Spring, June 21; Seawanhaka-Corinthian Annual, June 28; American Annual, July 3; Larchmont Annual, July 4; New Rochelle Annual, July 5; New York A. C., Block Island, July 12; Indian Harbor Annual, July 12; Larchmont Race Weeks, July 19 and 26; New York A. C., Open Annual, August 2; New Rochelle-Stratford Shoal, August 2; Horseshoe Harbor Annual, August 9; Huguenot Annual, August 16; Harlem-Stratford Shoal, August 16; Manhasset Bay Annual, August 23; Seawanhaka-Corinthian Fall, August 30; Larchmont Fall, September 1; Sachem Head Annual, September 1; Indian Harbor Fall, September 6; Stamford Annual, September 13.



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Two Men, a Maid and a Boat

(Continued from May issue)

By a mighty effort we at last aroused ourselves and while I cooked the breakfast Bayard took a swim in the exceedingly unattractive waters of Newport Harbor. While we were getting dressed to go ashore we were startled by a whirl above our heads and hastening to the after-deck we saw a hydroaeroplane skimming over the harbor. After lunching ashore we walked down to the navy dock. There were a couple of 40-mile runabouts racing about the harbor but the fog was so thick and sticky that we got no more than an occasional glimpse of them.

By midnight the fog cleared off and Friday morning was clear. No tossing and turning this morning; we were up in one bound. By 6 o'clock we were speeding across Narragansett Bay with the morning tide. A wind blowing out of the northwest filled our khaki top and held us back. We made fair time to Point Judith passing the lighthouse on the point at 7:30. Then Bayard decided the awning had better come down. The sun was hotter than at any time in the whole summer, and with eyes and scalps burning we ran on making Watch Hill, twenty miles beyond Point Judith at 9:30. After that the tide and wind were against us and we made slow progress, a small chop doing its darnedest to wet us.

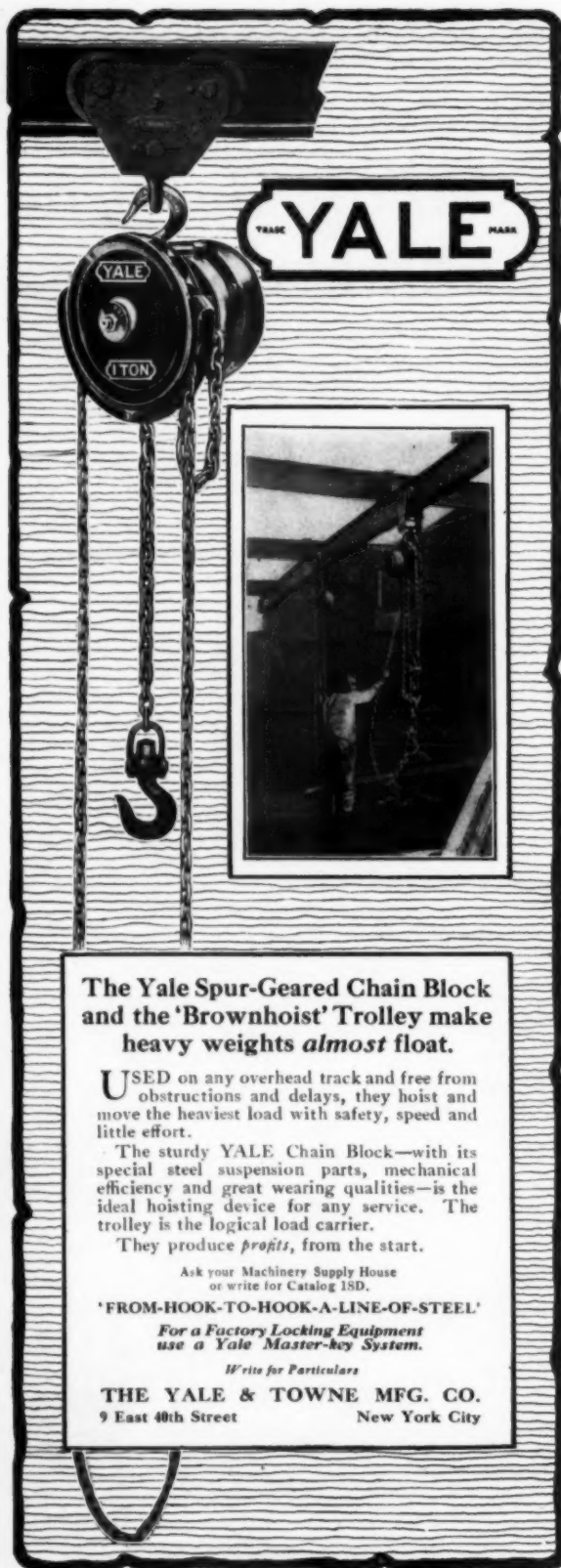
At noon I went on strike and demanded the awning, so we ran in behind the breakwater of the Connecticut River and up as far as Saybrooke, a town of Revolutionary fame, where we put our top up. The heat was terrific. Before lunch we got into our bathing suits. Bayard going into the water first, discovered a strong tide, so he got out, tied a rope under my arms, and I paddled around for a while on the end of a string, the other end of which Bayard held. By swimming as hard as I could, I found that I could just manage to stay in one place.

We sallied forth again at 2:30, the tide and wind still against us. Toward evening, running due west toward the setting sun we ran into two lobster buoys. There was a resounding thump on the bottom of the boat; we were sure the propeller had been hit, but the buoys emerged before our startled, searching eyes, and the boat continuing on its way without halting, we hoped for the best.

At 6:30 we ran up behind the New Haven breakwater and dropped anchor in Morris Cove just behind the lighthouse at 6:45. Darkness came on very early and far up the river we could see the gleaming lights of New Haven. We were not in a cheerful mood as we supped on our last can of beans, for we had visions of our trip on the morrow through the East River, of our landing in Astoria, and the visions were not pleasant. Had our pocketbooks not been so flat or our jobs so urgent, we should have turned our Boojum's nose toward the open sea, anywhere so long as skies were clear and we free from responsibilities. Disconsolately we spread our bed and turned in.

At 7:45 the next morning we were under way in a favoring tide, the wind still against us. A few hours' running brought us into familiar waters and Stepping Stones Light and Execution Rock appearing in the distance proclaimed that our journey was almost over. Past the Forts we drifted and sulkily turned into the East River. The day was hot and the smell of the river with its floating refuse appalled us. I hated it! I loathed landing at the dirty, greasy Astoria dock, but it had to be done and the cargo landed. Then farewell to flannel shirt and linen trousers, and howdy do to flimsy skirts and headgear.

I know my career has been neither varied nor adventurous, but nevertheless I believe small boat, ocean cruising is a unique sport. A tiny boat on a vast sea and while the motor continues to behave you are monarch of all you survey. Not a mark to greet your sight. As far as eye can see only the slow swing of the endless waters. A blue-gold sky above, a brisk breeze, salty spray on burning cheeks—Oh, the indescribable joy of it! Cool, silent, starry nights, colorful mornings, gorgeous sunsets. Here is life! Long days filled with arduous tasks; weary limbs that make feathers of the hard cockpit floor—and through it all, the strongest feeling of adventure, of expectation, for just beyond, ever menacing, lurks the great danger.



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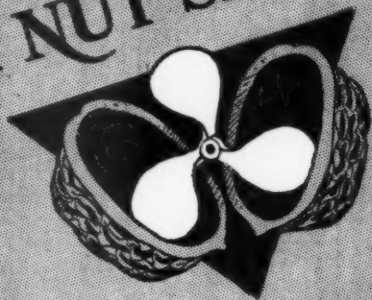
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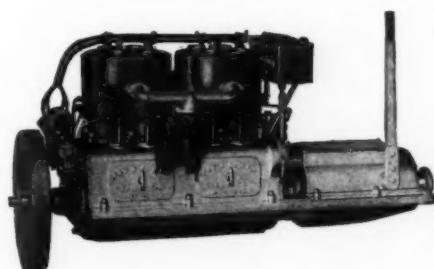


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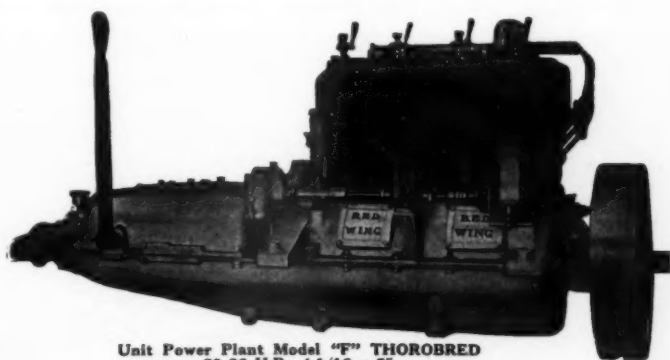
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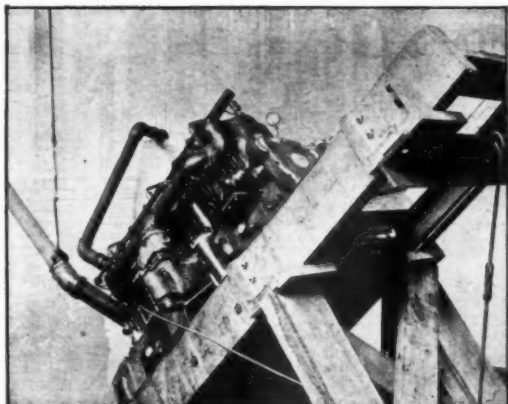
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